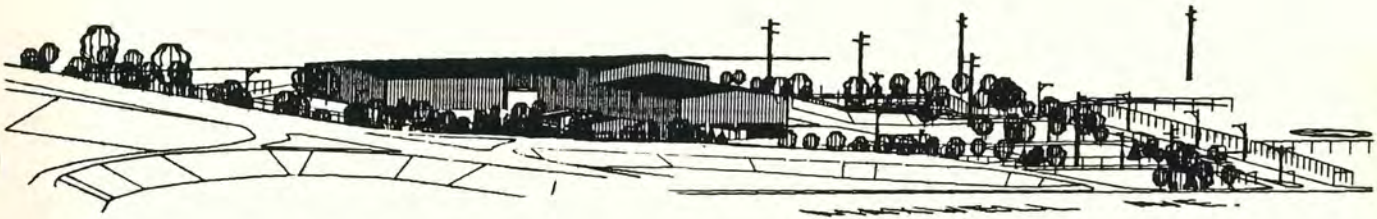


DRAFT ENVIRONMENTAL IMPACT STATEMENT

RAMSEY/WASHINGTON WASTE-TO-ENERGY PROJECT



Graphic by Northern States Power Company

Prepared by the Metropolitan Council of the Twin Cities Area

NOT



March 1985

RAMSEY/WASHINGTON WASTE-TO-ENERGY PROJECT

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Prepared by:

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ABSTRACT: Ramsey and Washington Counties have proposed construction of a municipal solid waste processing facility that would produce refuse-derived fuel and recover other materials at a site in Newport, Minn. The facility would be designed to process more than 1,000 tons of waste daily. This EIS describes and evaluates the proposed project, several locational alternatives, technological alternatives, and a no-build alternative as well as sociological and environmental implications. Written comments on this Draft EIS are due May 3, 1985, and should be sent to either of the Metropolitan Council planners listed above. A public meeting on this draft EIS is scheduled on April 23, 1985.

March 1985

Publication No. 12-85-046

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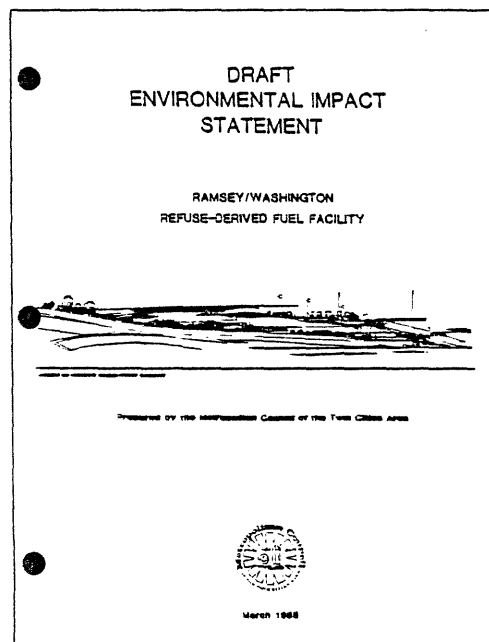
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EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

The Environmental Quality Board has established a review process for projects that have the potential for significant environmental impacts. Under that process, solid waste processing facilities designed to accept more than 500 tons of material per day must have an environmental impact statement (EIS) prepared before any permitting decisions can be made. This report details the findings of the EIS for the proposed 1,000 ton-per-day solid waste processing facility, to be located in Newport, Minn.

The project's scoping decision document, required as a part of the environmental review process, identifies the issues that the EIS must address. Those issues can be dealt with under several major headings: environmental concerns, alternatives to the project, land use planning, plant safety and management, and sociological impacts.

Environmental Resources and Technology, Inc. was retained by the Metropolitan Council to provide specialized analysis focusing on the following topics: processing technology alternatives, project-size alternatives, transportation and noise analysis, and air quality assessment. This report, entitled Draft Environmental Impact Statement Ramsey/Washington Waste-to-Energy Project, ERT Document D544, Mar. 1985, is referred to extensively in the EIS and is hereby incorporated by reference into the document.

A draft EIS for a mass-burn steam-generation facility to serve energy needs of 3M was also used extensively in the preparation of the EIS. This report, entitled Draft Environmental Impact Statement, Ramsey/Washington Waste-to-Energy Project, Metropolitan Council, Oct. 1983, is also hereby incorporated by reference into the document. Ramsey and Washington Counties have indicated an intention to implement this mass-burn approach if the resource recovery facility in Newport is determined to be not feasible.

ENVIRONMENTAL CONCERNS

No adverse impacts on groundwater or geologic resources are expected. In this respect the project sharply contrasts with the long-term risk to groundwater that results from land disposal of solid waste, one of the most likely no-build alternatives to the project. Soils will need to be imported and used as fill in order to provide an adequate foundation for the facility and to protect it against floods.

The site's wetland habitat acreage will decrease by about 65 percent. The proposer could construct new wetland areas to compensate for the loss.

Earthmoving, excavating and the movement of personnel and supplies will generate dust during the construction period. Dust emissions can be minimized by staging development, spraying water on haul roads, covering exposed surfaces and other measures. The volume of traffic going to and from the facility is low in comparison with the capacity of nearby roadways and so will not cause violations of air quality standards. The facility will control odors through prompt processing, storage restrictions, and chemical treatment procedures.

Noise levels at the site can be expected to change slightly. The levels will be effectively masked, however, by major traffic corridors and other industrial barriers. Residential receptors are remote from the site and should not perceive an increase in noise levels.

Site development will affect surface waters by altering drainage patterns, increasing runoff volumes and causing erosion. Changes in the site's surface contours will decrease the storage capacity of on-site wetlands. This loss of storage, in association with an increase in the area of impervious surface on the site, will result in higher runoff volumes. New ponding areas could be constructed and used to contain the runoff.

The facility should dramatically reduce the weight, volume and environmental instability of waste that will continue to be landfilled. At its minimum operating level condition, processing should avoid the landfilling of 45 percent of the waste stream generated within the counties through the recovery of metals and the production of refuse-derived fuel (RDF). The remaining material that would be landfilled consists of processing rejects, RDF ash, compacted waste not processed and materials not suitable for processing. The volume of these materials would be considerably reduced from their condition before delivery to the facility. Removal of organic materials and compaction will mitigate adverse environmental effects at landfills.

ALTERNATIVES TO THE PROJECT

The EIS investigated a number of alternatives to the proposed project. They included other waste-to-energy processes, alternative sites, a no-build option, and project size variations.

Ramsey and Washington counties initially focused on consideration of a mass-burn incinerator to serve 3M's energy needs. The RDF approach was finally adopted to increase the amount of landfill abatement and materials recovery that could be attained. Modular incineration, co-composting and pyrolysis are the other alternative waste-to-energy processes that are discussed in the EIS. The mass-burn approach is the counties' preferred alternative if the RDF technology is not found to be feasible.

Modular combustion units are prefabricated mass-burn units generally designed to process less than 200 tons of waste per day. They have rarely been used for large-scale processing. In general, these systems have encountered problems similar to those associated with the larger field-erected mass-burn units.

Co-composting processes combine solid wastes and sewage sludge. Usually the combined wastes are then aerated to promote decomposition to a stable, humus-like material that has good potential for commercial marketability. Only two large-scale systems are currently operating in the U.S. While large-scale systems are still considered to be experimental in this country, they have been used extensively in Europe. The potential availability of RDF beyond the capacity of existing boilers may provide an opportunity to co-compost on a supplementary basis.

Pyrolytic systems are also experimental. A number of pyrolysis processes have been developed in the U.S., but none has proven to be viable on a commercial scale. Pyrolysis processes produce both liquid and gaseous fuels. This technology is not reasonably available as a full-scale option.

If the proposed resource recovery plant or an alternative waste-to-energy facility is not built, the waste that would otherwise be burned must be disposed of by some other means, and Northern States Power Co., which has committed to use the RDF, will have to use an alternative source of fuel to generate electricity. Ramsey and Washington counties both have proposed to scale-up their co-composting efforts if the incinerator is not built. Co-composting

feasibility studies are still underway, but firm commitments have not been made by any of the parties involved. If co-composting is not implemented as a no-build alternative, it is likely that the waste will continue to be landfilled. Landfilling of municipal solid waste after 1990 is prohibited by Metropolitan Council policy.

LAND USE CONCERNS

Several sections of the EIS relate directly to land use. Permits and approvals, consistency with local and regional plans, provision of urban services and historical/archaeological resources all contribute to appropriate land-use decision making.

The resource recovery project and site appear quite compatible with local and regional proposals and policies. The project promotes the policies and objectives in the Council's Solid Waste Management Development Guide/Policy Plan by helping to maximize recovery of materials and energy from solid waste, by reducing the need for land disposal, and by making Ramsey and Washington counties responsible for the fate of a greater proportion of their solid waste stream. It conforms with the counties' plans for waste abatement, and is consistent with Newport's Comprehensive Plan, Critical Area Plan and Zoning Plan. The site is not important from a historical archaeological perspective because its previous use as part of a stockyard operation has probably obliterated most useful signs of previous human activities.

PLANT SAFETY AND MANAGEMENT

Proper transport, processing, storage and disposal is necessary for good sanitation as well as safe handling of hazardous wastes. Another important management concern is with the control and prevention of fires and explosions which have caused problems in the past at waste processing plants. General plant sanitation and vector control are other management concerns that directly affect the physical environment.

Inspection of waste prior to admission to the facility as well as before and during processing will help ensure that unsafe materials are identified and properly removed. Storage will be limited to three days under normal circumstances for wastes and recovered or residual materials. Plant design features and safety and monitoring equipment will minimize fire and explosion risks. The control of vectors (animals, plants, birds or insects that may be attracted to the waste) will be accomplished by frequent interior and exterior cleaning, almost constant movement of wastes being processed, enclosed storage of outputs, and compacting of wastes not processed. Pest control services will also be provided contractually.

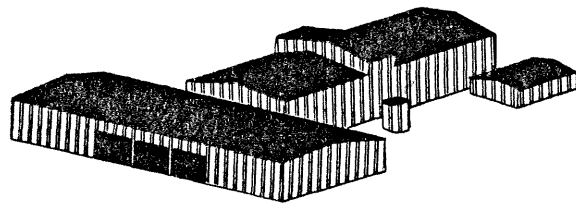
SOCIOLOGICAL IMPACTS

The major sociological impacts of this project affect economics, transportation and visual impressions. The project will create jobs during its construction and operation. Nearly 1,000 people will be involved in the construction phase. Approximately 81 new permanent jobs and other ancillary employment is projected in conjunction with the project. Plant staff, product output haulers, additional staff at NSP's boiler facilities and miscellaneous contract work are anticipated. Related spinoff business may develop in response to materials reclamation opportunities or the potential for commercial business catering to plant and hauler needs.

The amount of traffic generated by the project is low in comparison to the capacities of nearby roadways. Most travel to and from the plant will not coincide with peak travel hours on the adjacent roadways. Maxwell Rd. will be improved between the facility entrance and the I-494 interchanges to facilitate traffic flow.

Visually the facility will complement the other industrial uses in this low-lying area along the Mississippi River. The elevated I-494 roadway shields the site from residential Newport on the south. Hwy. 61 and I-494 dominate the landscape to the east, while an NSP substation and Northstar Steel limit residential views from the north. Development across the Mississippi River is also predominantly industrial in nature.

PROJECT DESCRIPTION



PROJECT DESCRIPTION

BACKGROUND

Washington and Ramsey Counties have proposed construction of a waste processing facility at a site in Newport, Minnesota. The facility will produce a refuse-derived fuel (RDF) product and recover ferrous metals, aluminum and possibly other materials that can be economically marketed. The RDF will be burned to generate electricity in regulated boilers operated by Northern States Power Co. (NSP) at Red Wing and Mankato. Figures 1 and 2 show the resource recovery site location and surrounding land uses.

The proposal is the culmination of a five-year effort, begun by the city of St. Paul, investigating the feasibility of waste-to-energy processes and markets. A conceptual evaluation of waste-to-energy processes was completed in 1980. A second phase addressed market evaluation. This work led to the identification of the 3M Center as the primary potential energy market. Since the 3M complex is in Maplewood, not in St. Paul, Ramsey County became an active partner in project planning.

Several potential sites for a mass-burn steam generation plant were identified in Washington County and a joint powers agreement addressing responsibilities under Minnesota's Waste Management Act was reached between the two counties and St. Paul. Under this agreement a multi-jurisdictional task force selected a Lake Elmo site in July, 1982.

The project came under the sole auspices of Ramsey and Washington counties in December 1982 through execution of a second joint powers agreement. To oversee implementation efforts, a project board was formed consisting of commissioners from each county and a representative from the city of Lake Elmo.

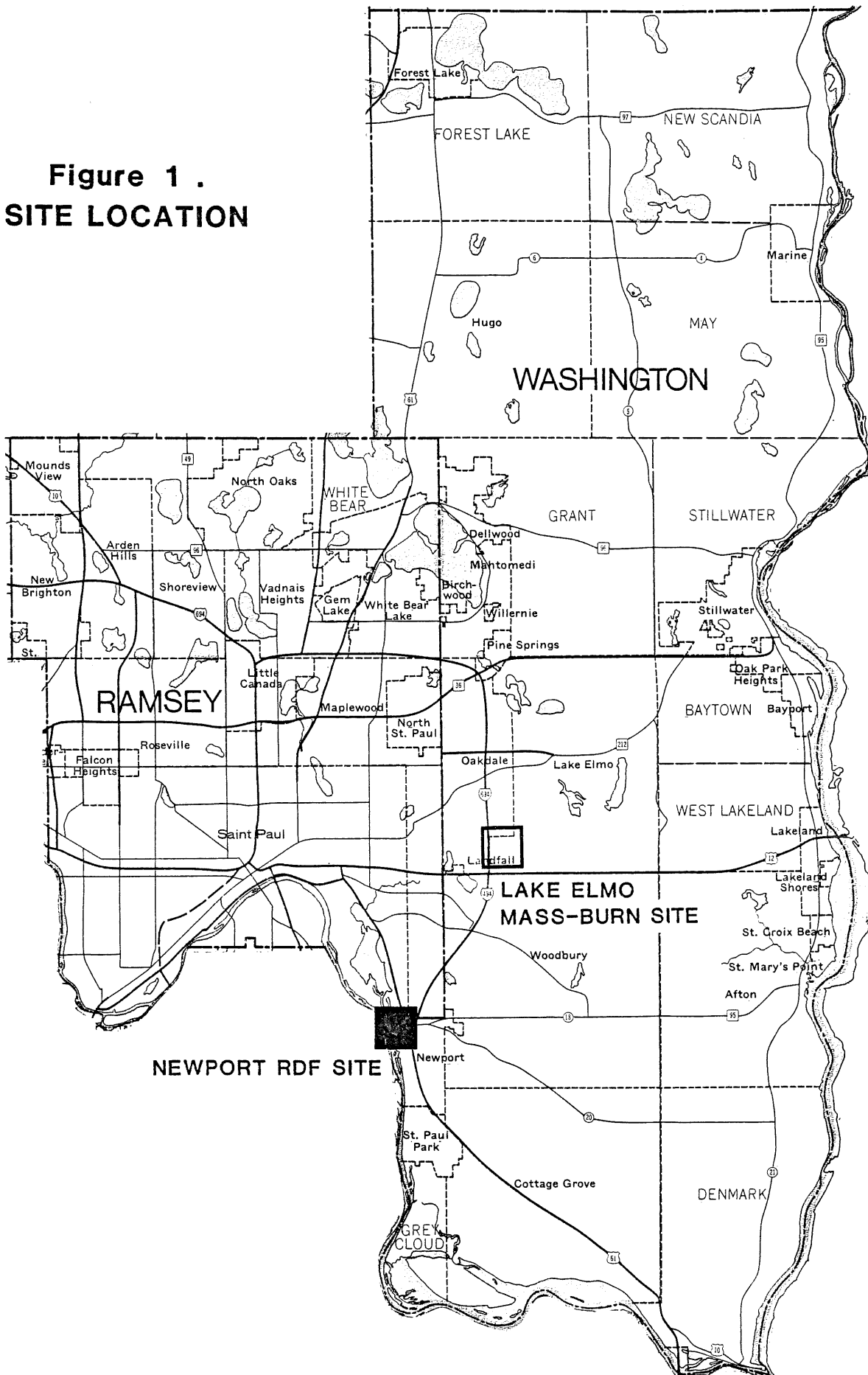
Landfill limitations and high costs led to changes in the waste-processing technology and site-location plans in 1984. The counties desired to achieve more landfill abatement than could be accomplished with a steam plant sized to serve 3M's energy needs. Moreover, the steam transmission lines and boiler facility involved high initial construction and land acquisition costs at a time when natural gas prices were leveling off, thus limiting the value of the steam energy. RDF technology using existing boilers offered lower initial capital costs and the potential to recover a higher proportion of the waste stream for reuse, with more flexibility for adjustment of materials markets to new supply sources in the future.

NSP was selected on a competitive basis to develop, own and operate a resource recovery facility in Newport. The counties' goal is to economically minimize the landfilling of solid wastes generated within their boundaries. The counties offered to guarantee a 900 ton daily minimum supply of mixed municipal waste to attract private sector participation in project financing and operation. The project board was adjusted through the replacement of the Lake Elmo representative with one from Newport.

CONCEPT

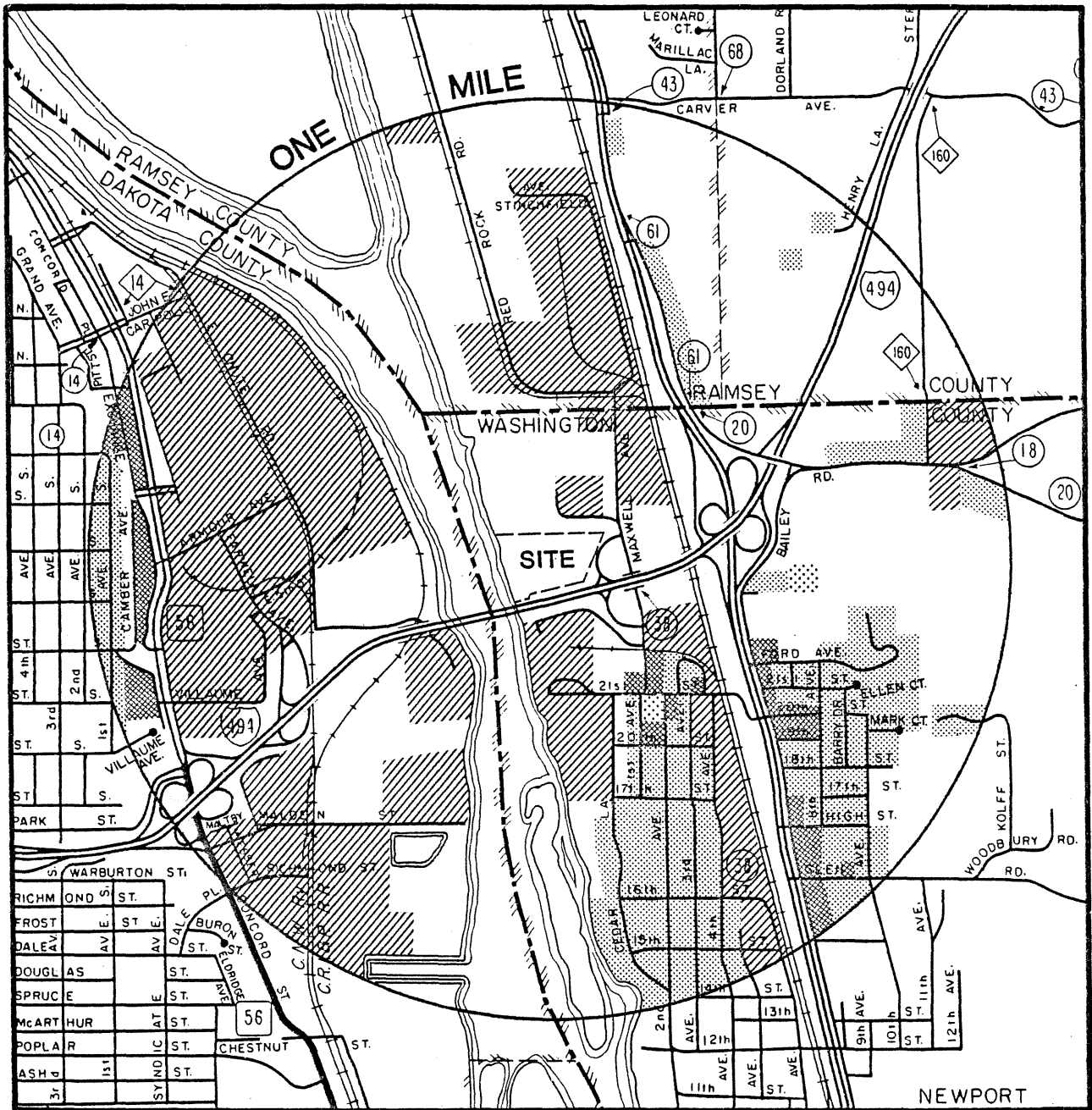
The counties propose a facility which at a minimum will process 900 tons of waste per day, with an annual through-put of 280,800 tons of mixed municipal solid waste based on six days of operation a week. The waste estimated to be generated annually (492,800 tons) was adjusted downward to project a daily operational expectation reflecting seasonal variations in waste generation, waste reduction, more source separation and recovery of materials, and a margin

**Figure 1 .
SITE LOCATION**



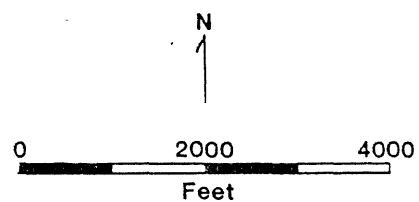
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Figure 2.

GENERALIZED LAND USE WITHIN ONE MILE OF SITE



Base Map Source: Minnesota Dept. of Transportation

-  Residential
-  Commercial/Municipal
-  Industrial
-  Public Open Space/Cemetery
-  Vacant Land



for unpredictable changes. NSP has guaranteed that it will process at least 1,000 tons of waste per day if sufficient quantities are delivered. Figure 3 portrays the impact the RDF plant is expected to have on the waste generated within the two counties.

It should be noted that the plant will have the flexibility to process more than the 1,000 tons of waste per day projected in Figure 3. Operation for more than the projected 10-hour a day, six day a week schedule could increase production. Higher processing volumes will correspondingly increase the recovered metals, processed residuals, RDF and RDF ash outputs. If waste generator recycling and composting increase to 20 percent of the waste stream as projected in the Metropolitan Council's Solid Waste Management Policy Plan, the RDF facility would have an average excess waste supply level of six percent when operating at 1,000 tons per day.

Certain wastes like demolition debris and hazardous substances will not be accepted at the facility. Occasionally, some of these unacceptable materials will be observed by plant staff and segregated for the type of disposal appropriate.

The facility is expected to receive all the acceptable waste generated in the two counties pursuant to the Joint Ramsey/Washington County Waste Designation Plan and related ordinances. Readily apparent non-processable material and goods that can be recycled directly will be removed and the remainder will be subjected to a series of size reduction and separation processes that aggregate recyclable materials, RDF, and residue that will be landfilled. The RDF will fire NSP boilers that generate electricity. It is the intention of the counties and NSP to add additional resource recovery capability to eventually eliminate the residue fraction that is rejected and landfilled. The glass in this residue fraction has a good potential for being profitably recovered in the future.

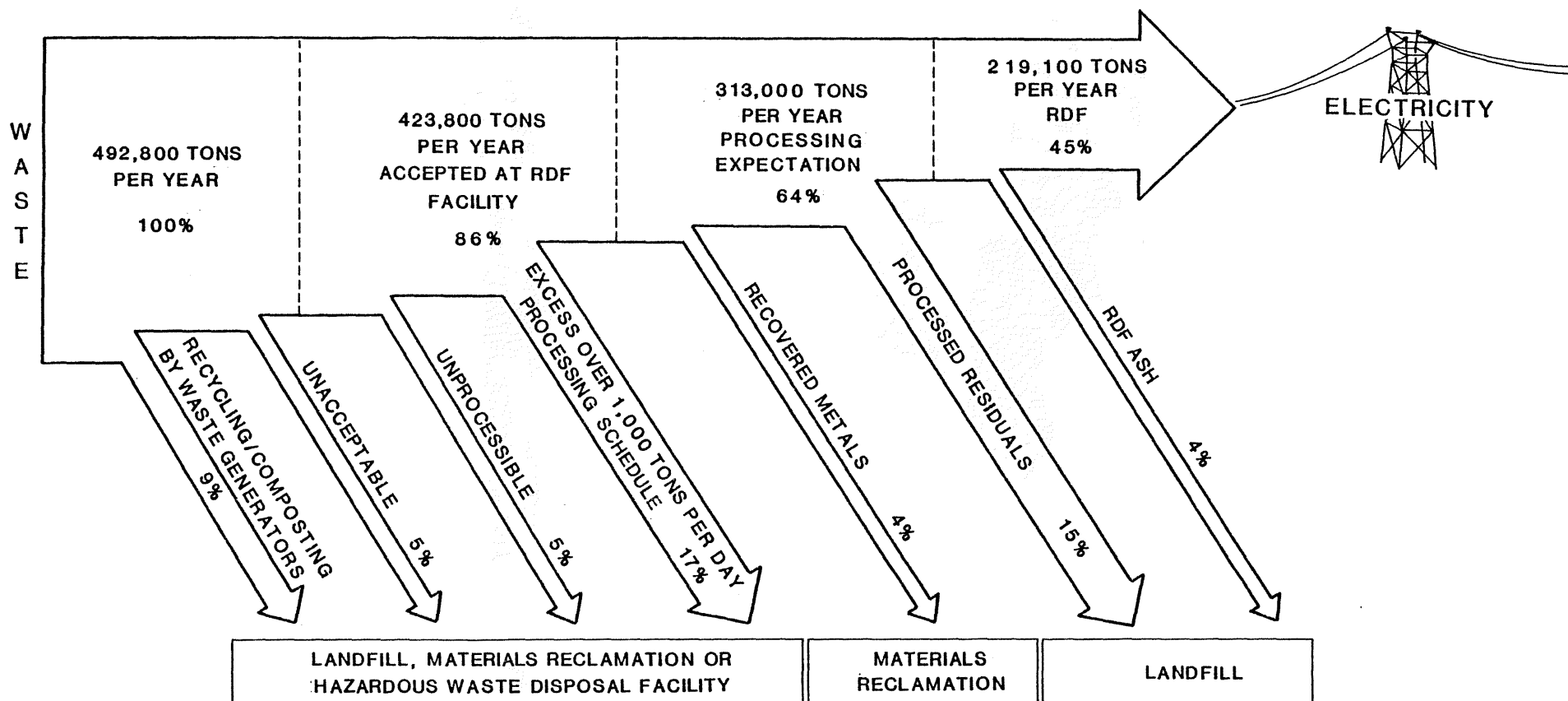
The basic concept assumes that approximately 70 percent of the MSW stream is comprised of combustibles, and if the remaining balance is removed as either valuable secondary materials such as ferrous and aluminum, or material such as residue for landfill, the balance may be shredded and used as fuel in a dedicated RDF boiler. Therefore, the design philosophy is to selectively remove non-combustibles until only combustibles remain.

It is also anticipated that some unprocessable materials, such as rolled up carpet, bed springs, large automotive parts, cable, etc., will occasionally be present in the MSW feed to the resource recovery plant. In addition, potentially hazardous materials such as propane bottles, chemicals, aerosols, cleaning fluids, etc., will appear. Inspection and picking points will, therefore, be provided to minimize the introduction of undesirable materials into the process.

THE FACILITY

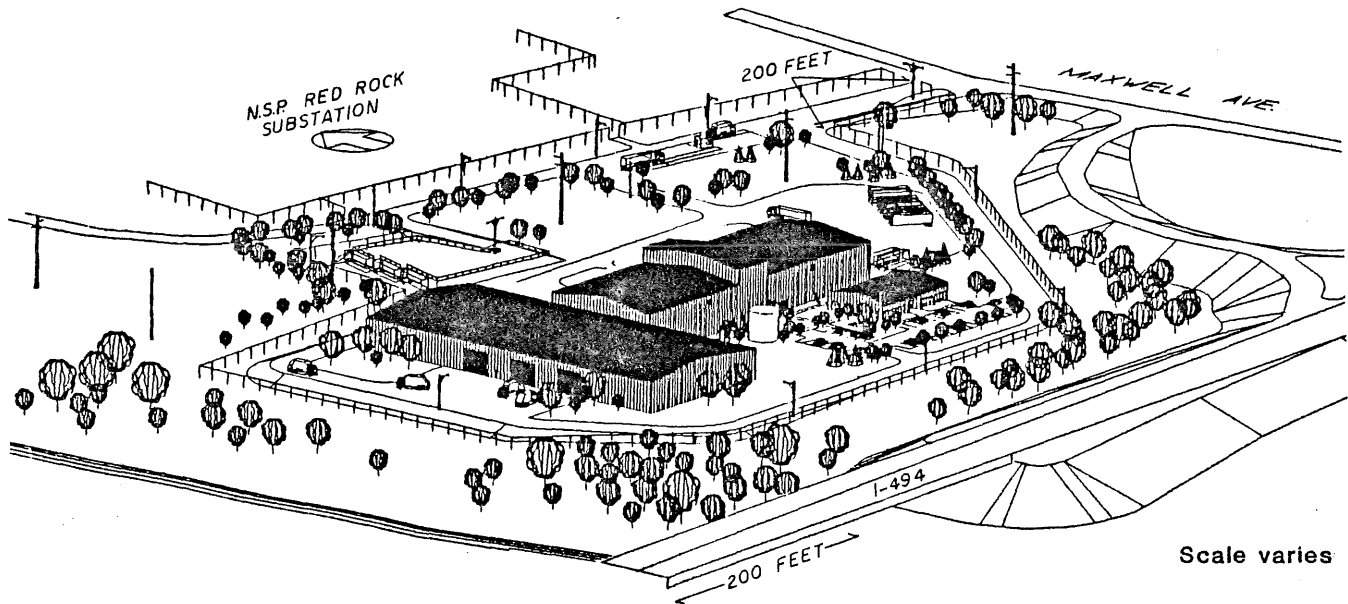
The facility will provide for municipal solid waste (MSW) receiving, storage and processing. The receiving and storage portion will have capacity for 3,000 tons of MSW, 300 tons of RDF storage in trailers, a three-day accumulation of ferrous and aluminum metals, and other residue. Waste that exceeds processing capacity can be compacted for transport to landfills. In addition to the receiving and processing buildings, the facility complex will include a scale/guard house, an administration building, a visitors' area with displays

Figure 3 . RAMSEY/WASHINGTON WASTE STREAM WITH RDF FACILITY

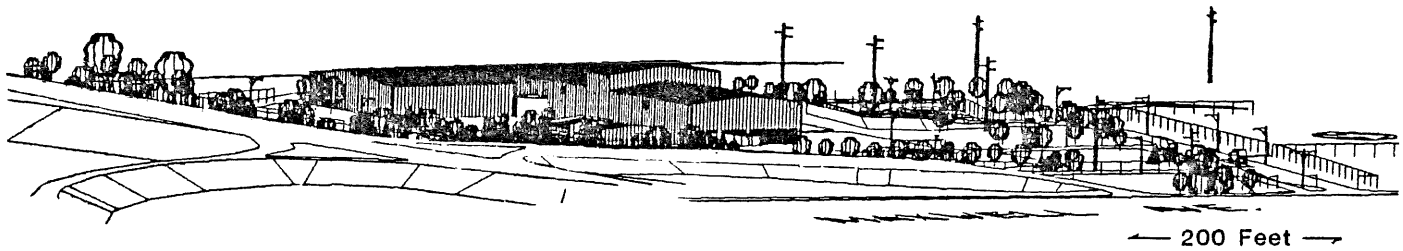


Source: Northern States Power Company.

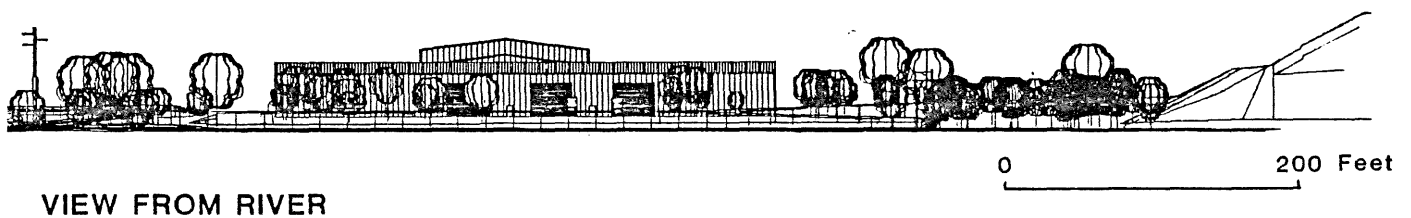
Figure 4. SITE RENDERINGS



OBLIQUE VIEW FROM SOUTHWEST



VIEW FROM MAXWELL AVENUE



of self-explanatory descriptive information, and a citizen's refuse disposal area where refuse delivered by citizens will be deposited in open-top trailers stationed at a lower level. See Figures 4 and 5 for site plan information.

The RDF process will feature the kind of equipment now operating at Weber County, Utah and Baltimore County, Maryland. Both of these facilities were designed and are operated by National Ecology, NSP's RDF consultant and process designer. The facility will have two processing lines rated to handle 50 tons per hour each. A 10-hour processing schedule will achieve the 1,000 ton per day guarantee under normal conditions. Maximum output of 1,600 tons per day could be achieved with a 16-hour processing schedule and an eight-hour shift for processing line maintenance and repair. See Figure 6 for a schematic of the processing system.

Upon being coarsely shredded in a flail mill, liberated from plastic bags or other containment devices, and magnetically processed for recovery of ferrous metals, it is found that MSW tends to fall into size ranges with the following characteristics:

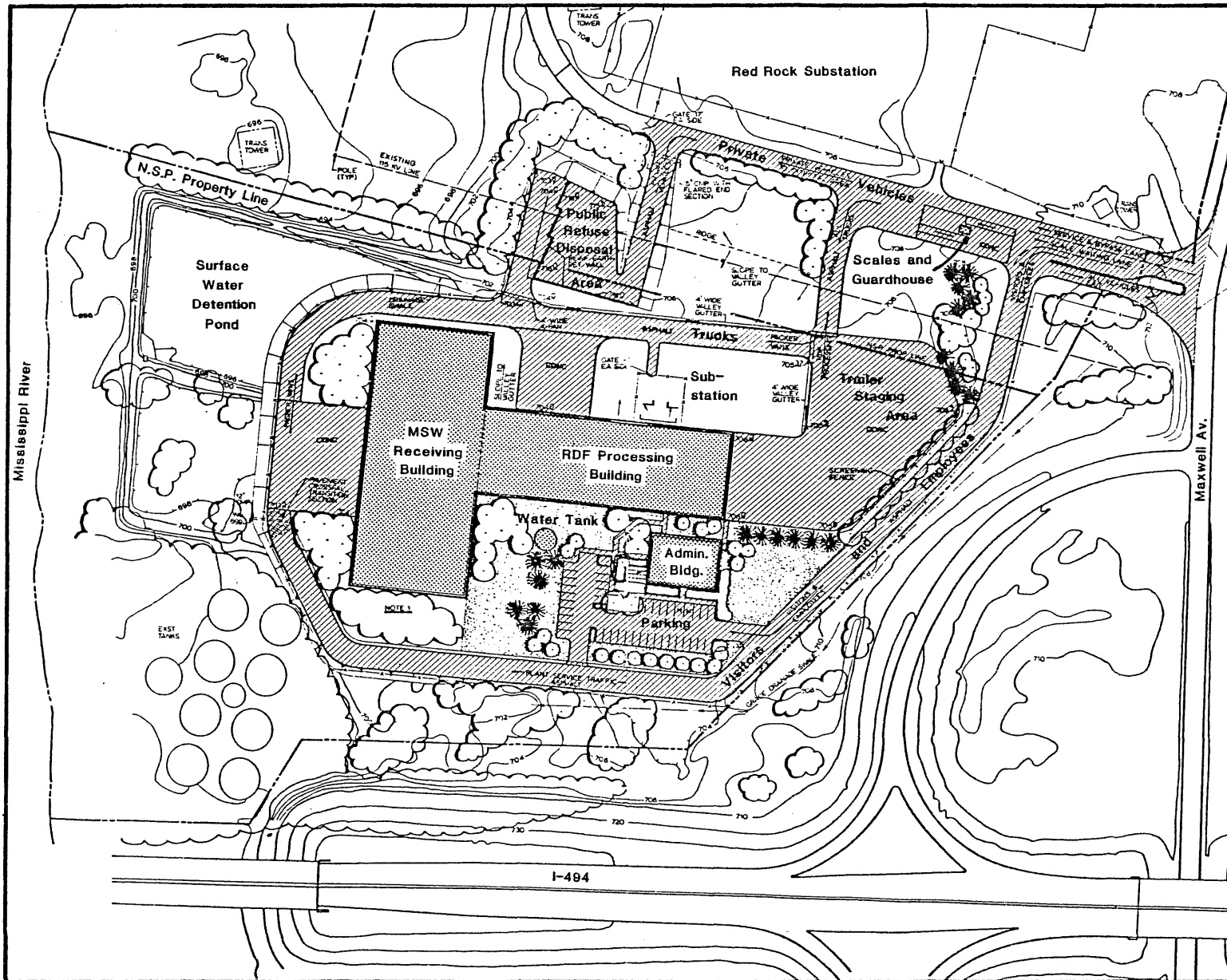
- o Glass, stones, ceramics, dirt, and
other ash forming components..... -2"
- o Ferrous and aluminum canstock..... 2"-4"
- o "Heavy" ferrous and non-ferrous metals..... +4"
- o Combustibles (paper, cardboard and plastics)..... +4"

The natural separation sizes are, therefore, 4" and 2".

Self-cleaning, agitating disc screens will separate materials with dimensions less than four inches and further separate the smaller materials with a two-inch screen. The oversize from the primary disc screen (+4") will be directed to an air density separator which will remove the heavy fraction (ferrous and non-ferrous tramp metals) from that stream. The tramp metals will be directed to residue loadout while the light fraction from the separator will be directed to the shear shredder for final size reduction and RDF product loadout. The undersize from the primary disc screen will be directed to the secondary disc screen. The oversize that does not pass through this screen becomes RDF except for aluminum cans that are concentrated and manually sorted out. The undersize from the secondary disc screen will be further processed to remove combustibles which will be directed to RDF loadout while the noncombustibles will be directed to residue loadout.

In summary, this design utilizes the concept of primary size reduction by flail mills, general sizing by disc screens, removal of specific recyclable items such as ferrous and aluminum by magnetic and manual sorting procedures, and density separation in air knives. Organic material of a variety of sizes will be converted to RDF and minimize the volume of relatively light combustibles that will be landfilled. Table 1 provides an inventory of unit processes and equipment.

Figure 5.
PRELIMINARY
SITE LAYOUT



Sources: Northern States Power Co.; Stone and Webster Eng. Corp.



0 100 200 300
Feet

Figure 6. SIMPLIFIED PROCESS FLOW DIAGRAM
(100 TON PER HOUR MASS BALANCE)

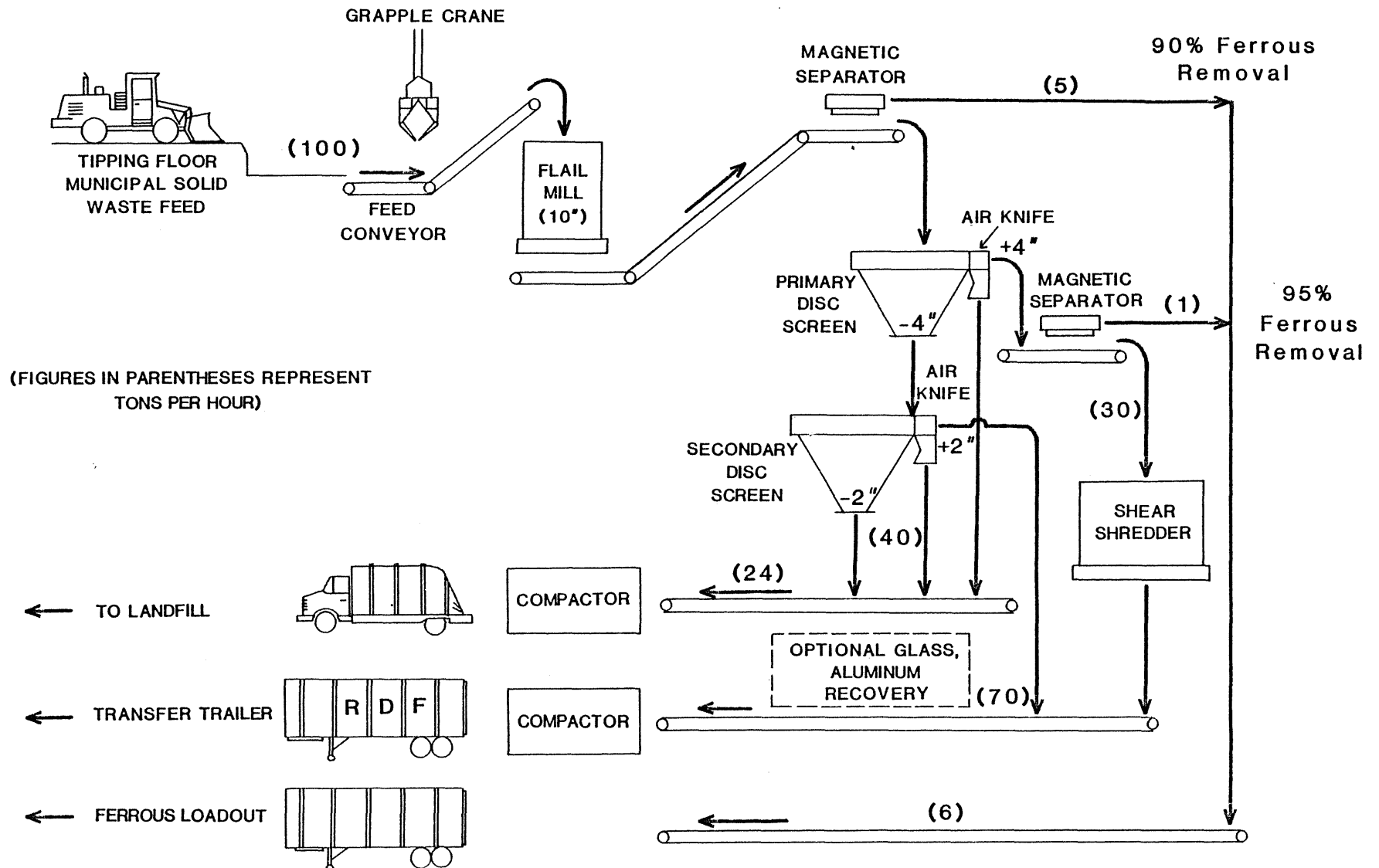


Table 1
UNIT PROCESSES & EQUIPMENT REQUIRED

Unit Processes

1. Receiving and storage of MSW from packer trucks.
2. Inspection.
3. Size reduction and liberation by flail mill.
4. Sizing by disc screen.
5. Pre-concentration of recoverable materials by size.
6. Materials recovery (metals and, possibly, glass).
7. Recovery of small, relatively light combustibles.
8. Dust control.
9. Inter-process materials handling system.

Required Equipment

1. Apron conveyors
2. Hydraulically actuated grapple cranes
3. Flail mills and shredders
4. Magnetic separators
5. Disc screens
6. Air density separation devices
7. Baghouses
8. Belt conveyors

Source: NSP, Proposal for the Ramsey/Washington County Resource Recovery Facility, Dec. 1984.

System control will follow a run/no-run philosophy in which all upstream unit operations are governed by the availability of downstream unit operations. Normal operation will be directed from the central control room, but local operator control is an option.

Dust control will be accomplished by close containment of all transfer points and aspiration wherever significant impact is anticipated. Various semi-airborne light fractions will be settled out onto belts and within tube conveyors and the dust so generated is aspirated to baghouses.

WASTE FLOW THROUGH THE FACILITY

The tipping floor will be on grade and contained by push-walls. It will have capacity to store 3,000 tons of MSW, the volume typically delivered over a three-day period. Additional space for residue storage will be in the receiving building on the tipping floor. Some limited sorting will take place on the tipping floor to the extent that an equipment operator is able to remove and set aside obvious salvage and items that cannot be processed. The MSW will be pushed onto two pit-installed apron conveyors arranged in staggered parallel formation so that a single front-end loader can serve both lines when the rate of processing is relatively light.

Raw MSW will be conveyed out of the pit by the apron conveyor and examined visually by a knuckleboom loader operator. The operator will use the equipment to pick off any material suitable for shredding and load it into a nearby container. The operator will also have speed control of the conveyor. Speed control will be based on personal judgment, flail mill capacity and the occasional necessity to move material around on the conveyor in order to better expose and pick off unprocessable items.

The flail mill will reduce the size of the MSW materials to ten inches or less. Next the waste will pass under a belt-type magnetic separator. The ferrous pre-concentrate from this operation will be further refined in a small air classifier which removes such loose contaminants as paper and film plastics. The clean ferrous products from each of the two lines will be combined onto a conveyor for loadout through a small holding bin.

The flailed ferrous-free MSW will be deposited on the primary disc screen. The oversize (+4") will contain some heavy pieces of non-ferrous metal and possibly other heavy materials which might either cause excessive wear in the shear shredder or contribute to materials handling problems with the shredder output, the RDF. These will be removed as a heavy product in the primary air knife and conveyed to a stationary compactor for landfill loadout. The light fraction from this operation will be fed into the shear shredder and becomes RDF.

The undersize portion (-4") from the primary disc screen will contain usable fuel, most of the ash-forming constituents in the MSW stream, and the nonferrous beverage containers, as well as fragments of glass. A secondary disc screen will pre-concentrate the beverage containers as an oversize (+2 1/2") fraction which will be reclaimed manually from a downstream picking belt. This aluminum concentrate will be fed into flattening rolls and conveyed to loadout. The remaining output from this operation is RDF and residual waste. Anything obviously harmful to the RDF or its handling system will be removed during the aluminum picking operation.

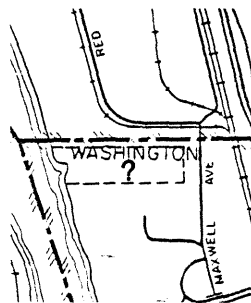
The undersize from the secondary disc screen (-2 1/2") will be a mixture of light combustible material and heavy inerts such as glass and rock. Some wet heavy organics of low BTU value may also be present. This undersize stream will be separated into light and heavy fractions in the secondary air knife. The light fraction becomes RDF and the heavy fraction passes to the landfill residue compactors.

The final RDF stream will consist of a composite of material from the shear shredders, oversize material from the secondary disc screens (picked free of aluminum) and light combustible material separated by the secondary air knives. The RDF stream will be outloaded through compactors to semi-trailers for transportation to the power plants. It may be necessary to landfill part of the MSW without processing it into RDF. A separate transfer line will be provided to compact this waste and load it on semi-trailers. Transfer without processing will only be necessary if the MSW delivered to the plant exceeds processing and storage capacity. An interruption of operations for extensive processing line repairs could create a need for a significant level of transfer activity.

SCHEDULE AND COST

Construction is scheduled to begin on July 1, 1985. The facility is expected to be completed by July 1987 and begin normal operation before 1988. Construction cost is estimated at \$20.7 million and the annual operating budget is projected at \$8.7 million. Total project cost including land acquisition, public utilities, consultants, project administration, financing, and a contingency reserve is figured at approximately \$31 million. Neither figure includes investments NSP anticipates undertaking privately for additional processing capability at Newport or for RDF receiving and boiler modification at Red Wing and Mankato.

ALTERNATIVE CONSIDERATIONS



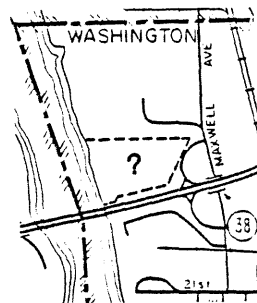
RDF

CO-COMPOSTING

PYROLYSIS

MASS-BURN

LANDFILLING



ALTERNATIVE CONSIDERATIONS

An EIS must compare a project with reasonable alternatives such as different designs, sizes, locations and the "no action" option. Eliminated alternatives should be explained and discussed. This chapter covers alternative technology, locations, implications of not proceeding with the project and alternative project size considerations.

TECHNOLOGY

The Metropolitan Council contracted with Environmental Resources and Technology, Inc., to analyze processing technology alternatives. The document containing the analysis was incorporated by reference in the EIS Executive Summary. This section summarizes the consultant analysis of technology alternatives and describes other factors that have relegated the mass-burn option to a fall-back status for Ramsey and Washington Counties.

Mass-Burn Process*

In this technology, the waste-to-energy system accomplishes both volume reduction of refuse and the use of generated heat to produce steam and/or electricity. The incinerator is typically fed by a reverse reciprocating stoker and integrated with a multipass, welded waterwall boiler. The system generally employs an electrostatic precipitator for removal of particulates. Mass-burn incinerators burn municipal refuse that has not been preclassified or pre-treated. The solid waste is incinerated as received, and only large, bulky items are separated. The mass-burn process is illustrated in Figure 7. Over 400 mass-burn facilities operate worldwide, and refinements have occurred in the technology over the last 20 years.

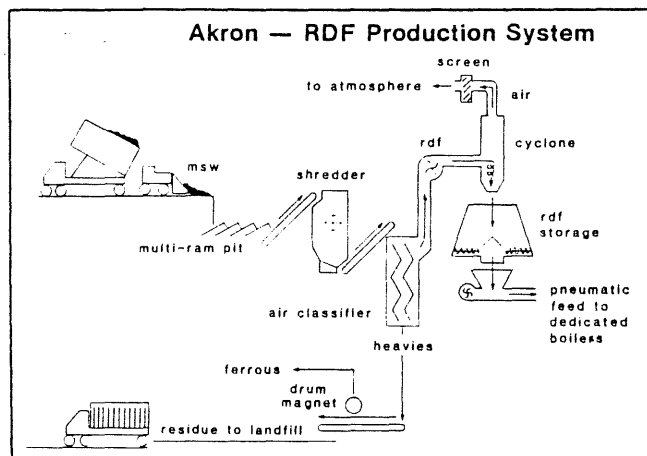
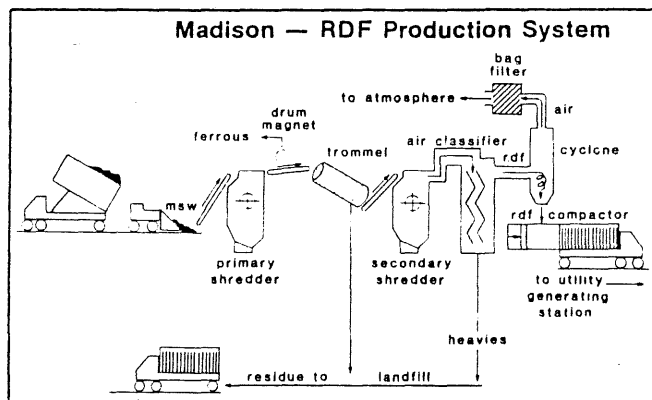
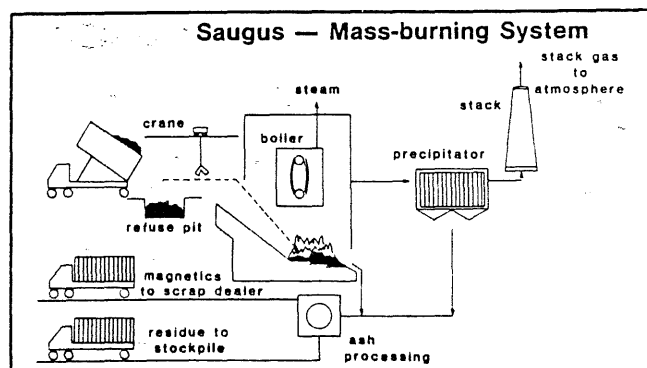
Refuse-Derived Fuel (RDF) Process*

In the RDF technology (Figure 7), municipal solid waste is typically first sorted to separate out noncombustibles and then shredded to near-uniform particle size before being introduced into a high-velocity column of air (air classification) to "blow-off" the light, primarily organic material. The product of this process is RDF. This technology can be used in many combinations to process waste, and it is, therefore, possible to produce RDF fuel in several forms. The heavy, primarily inorganic, fraction can be channeled through a series of separation processes to sort out iron, as well as aluminum and glass. Depending on the particular system and the desired separation, such processing can include secondary shredders, screens, magnetic separators (ferrous metals), eddy current separators or "aluminum magnets" (aluminum), froth flotation units and optical sorters (glass).

A primary objective of the production of RDF is the removal of nonburnable, inorganic materials in order to enhance the burnability of the combustible materials (the RDF). A second objective is to facilitate the mechanical recovery of recyclables from the inorganic fraction. Experience to date reveals that over 80 percent of an RDF facility's product revenue comes from the sale of the fuel, not the sale of recyclables.

*National Center for Resource Recovery, Inc.

Figure 7.
EXAMPLES OF MASS-BURN AND RDF PROCESSES



Source: Solid Wastes Management, August 1981.

Pyrolysis Process*

In a pure pyrolysis process (see Figure 8), organic material is thermally cracked into solid char and volatiles in the absence of air. Heat for cracking is usually generated by electrical resistance heating, or by combusting fuel gas either in a firebox that surrounds the reaction chamber, or in fire tubes inserted into the reaction chamber. In practice, pure pyrolysis is achieved only in batch reactors where complete removal of air is possible. The operation of more efficient continuous fed units is accompanied by air injection and subsequent partial combustion of volatiles and carbon. As a consequence, the quality of the resultant fuel gas is degraded relative to batch reactor gas by the presence of a large proportion of noncombustible nitrogen and carbon dioxide. Typically, organic waste is chemically broken down at high temperature (900 to 3000°F) in the absence of oxygen. A gaseous fuel or an oil-like liquid fuel can be produced through this process.

Several alternative pyrolysis technologies have been suggested. The Mansonto Landgard system is designed to shred incoming waste to a uniform size range. It is then fed into a rotating refractory kiln and pyrolyzed at a maximum temperature of 1765°F. The resulting gases are then burned to produce steam for sale. An alternative process is the Andeo-Torrex system in which pyrolysis occurs in a vertical shaft. Air is preheated and blown into the bottom of the furnace which is fed from the top with refuse. Noncombustibles are recovered and steam is produced from the combustion of the pyrolysis gases. Union Carbide has pioneered a technology called the Purox process. The pyrolysis gases are compressed and refined into a fuel comparable to natural gas. Another alternative, the Occidental flash pyrolysis system, also produces fuel gas, but can be altered to compress the gases to a liquid fuel.

Co-Composting

Co-composting (Figure 8) is method of managing solid waste and sewage sludge. Municipal co-composting systems typically operate in five sequential steps: preparation, digestion, curing, finishing or upgrading and storing. Co-composting** is the decomposition of organic solid wastes to a relatively stable humus-like material. Decomposition is accomplished by various micro-organisms including bacteria, actinomycetes and fungi. The by-products of aerobic decomposition are principally carbon dioxide, water and heat. Optimum temperatures for aerobic processes have been reported to be between 95-149°F (35C-65C°).

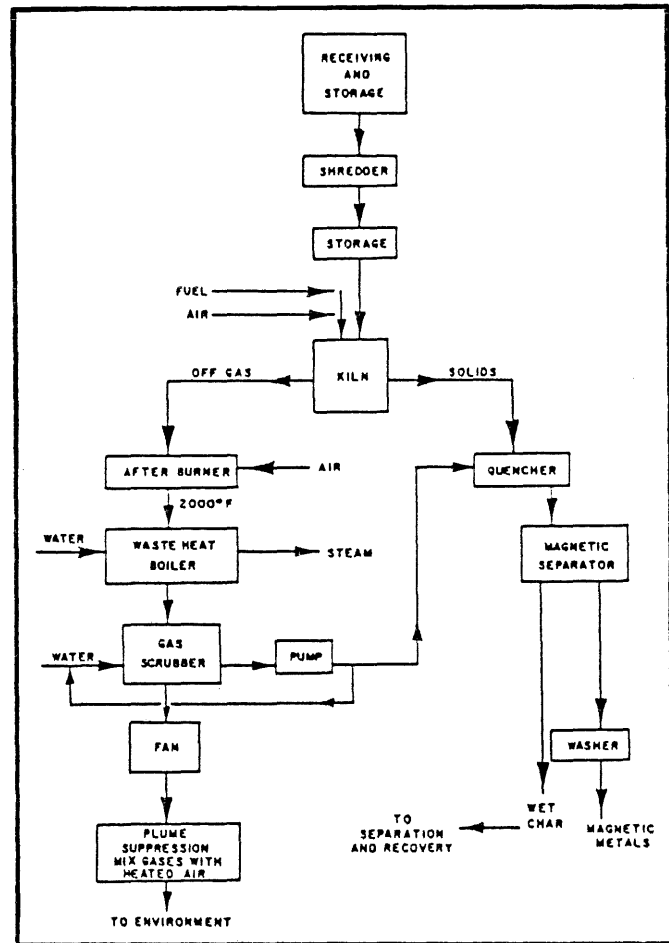
The various composting technologies are windrow pile, aerated static pile and mechanical systems. Mechanical composting systems include those processes which utilize automated equipment for turning and aerating the compost during the digestion phase. This includes rotating drum digesters, circular tank-rotating arm digesters and multideck digesters which mechanically pass the compost system between deck-serated static pile systems. Aerated static pile systems involve placement of the material over air jets that introduce oxygen to accelerate decomposition of the wastes. Windrow pile systems include those processes which involve piling material in rows with periodic turning by front-end loaders or manually for smaller scale systems.

*Fuels from Biomass and Wastes, Klass and Emert, 1981, Ch. 11, pp. 207-237
Ann Arbor Science Publishers, Inc.

**National Waste Processing Conference, 1980 Washington, D.C., p. 122.

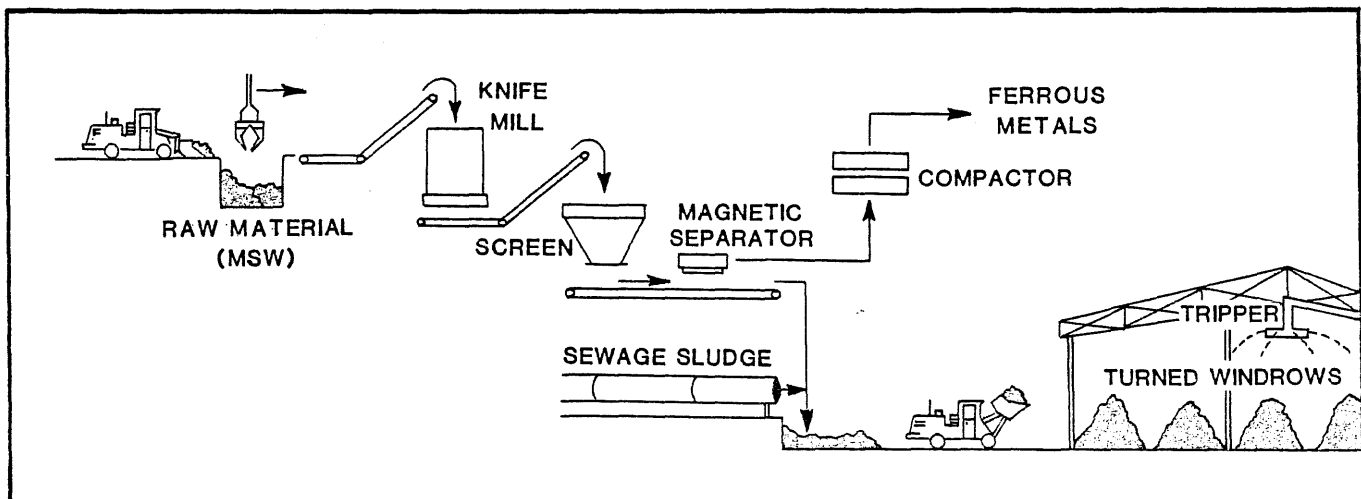
MONSANTO LANDGARD SYSTEM

Figure 8.
EXAMPLES OF ALTERNATIVE
TECHNOLOGIES



Source: Adapted from Greenberg, 1976.

COARSE PROCESSING/CO-COMPOSTING



Source: Buhler-Miag Co.

In most modern co-composting, the aerobic process is used rather than the anaerobic. There are three major reasons for this: time of process, temperature and odor problems. Aerobic decomposition with microorganisms requires free oxygen to decompose the waste. The speed of decomposition is oxygen dependent. Too little oxygen and the process may either slow down or become anaerobic. Thus, in forced digestion systems, oxygen must be introduced by force draft or agitation. The forced digestion system reduces the windrow composting time of approximately six weeks to around five to seven days.

In the aerobic systems, the temperature reaches 60° to 70°C or higher. This level of heat in the processing and finishing destroys pathogenic organisms, weed seeds and fly ova. With the anaerobic systems, temperatures are only about 38° to 55°C and pathogens may survive. Also, anaerobic decomposition produces foul odors. In aerobic decomposition, the process progresses rapidly without excessively unpleasant odors. The major odor and pest problems in the windrow method are either from cooler outer regions or pockets of the windrow where the oxygen has been exhausted and anaerobic decomposition is taking place.*

Evaluation of Alternative Processes**

Capital Cost

Costs of existing plants were identified and typical costs of 1,000 ton-per-day facilities were estimated as follows: mass-burn--\$50 to \$75 million; RDF with existing boilers--\$20 million; and co-compost--\$15 to \$50 million. Pyrolysis plants on a 1,000 ton-per-day scale do not appear to be practical; costs for a 100 ton-per-day system were estimated at \$2 to \$4 million.

Operating Cost

In the initial years of operation, an RDF facility using an existing boiler will have a lower operating cost per ton of solid waste processed than a mass-burn facility. Over a 15- to 20-year period, the net costs for an RDF facility would be expected to rise due to equipment maintenance and replacement costs. Therefore, an RDF facility has the potential for significantly lower initial operating costs relative to mass-burn, but over the project life it is believed that the cost of RDF and mass-burn systems are about equal. Pyrolysis and co-compost operating costs are comparable to those of the mass-burn and RDF technologies although the co-compost estimates are at the low end of the range identified.

Reliability

Mass-burn technology is proven nationally and worldwide with more than 400 successful operations. In general, RDF technology has not proven as reliable as mass-burn. This technology was initially introduced in the U.S. on a significant basis in the early 1970s. Typical problems included: excessive shredder maintenance needs; fire and explosion hazards, in-plant air quality and waste storage. It is possible to address these problems as at least seven RDF

*Energy from Solid Waste Recent Developments; Energy Technology Review No. 42, Pollution Technology Review No. 56, Noyes Data Corp.; 1979; pp.57-59.

**Ramsey/Washington Waste-to-Energy Project Draft EIS consultant report, Environmental Research and Technology, Inc., pp. 5-27.

plants currently operating in the U.S. demonstrate. Pyrolysis systems are complex and must conform to critical performance criteria. Large plants have not been viable in the U.S. and none are operational on a full-scale basis. Despite a fairly simple process, only two co-composting plants are believed to be currently operational in the U.S.

Thermal Efficiency

Mass-burn plants generally achieve waste volume reduction of 90 to 95 percent, and thermal efficiencies of 60 to 75 percent. RDF plants achieve higher thermal efficiencies with processed waste, but less waste volume reduction because some organic material is not recovered in processing and becomes a residual that is landfilled. Pyrolysis should produce a low-sulfur, high-quality fuel output about 2.2 times the input energy heat value. It is potentially a more efficient and versatile technology than incineration. Co-composting produces recoverable gas only as a by-product.

Availability

Mass-burn technology is available on a small-scale modular basis, where a pre-assembled product is delivered, or on a larger-scale field-erected basis custom designed for the amount of energy output desired. RDF technology and vendor expertise are available. No U.S. pyrolytic system, other than an inoperative plant in Baltimore, is known to have progressed from the experimental or pilot plant stages. Only two co-compost plants are believed to be operational in the U.S. The technology has, however, been widely used in Europe. There are companies in the Midwest with the interest and capability to develop co-compost plants.

Environmental Concerns

Mass-burn concerns include: fugitive dust, ash, odors, noise, residue (fines, unburned combustibles, metal, glass/rock), microorganisms (aerosols), organic compounds (flammable gases and vapors, and pesticides), and other occupational health considerations. The primary consideration is air pollution, but control technologies including electrostatic precipitators and scrubbers can successfully control emissions.

It is generally believed that most types of air emissions from RDF fired boilers are less objectionable than those from mass-burn fired boilers. Processing to concentrate organic materials of uniform size is believed to contribute to more complete combustion. Existing boilers used for RDF combustion typically achieve more complete material decomposition because they are designed to more precisely meter fuel and oxygen than incinerators are. Other environmental concerns such as noise, traffic and materials handling risks are known to exist. These concerns appear to be of the same order of magnitude as those associated with similar size mass-burn facilities. Fire and explosion hazards have been associated with RDF facilities. High dust levels appear to be common within RDF plants. EPA studies have indicated additional in-plant health risks from microorganisms. Excessive dust buildup can potentially be a source of explosions.

Pyrolysis processes produce emissions containing tars, particulates and corrosive gasses that can be reduced with electrostatic precipitators and scrubbers. Water effluents are also produced that contain acid gases, corrosive tars and oily substances that must be removed.

In co-composting, if anaerobic digestion occurs, potential odor and health problems can result. In addition, since aerating piles are in many instances exposed, there is concern regarding infiltration by vectors and/or other animals. There could be a potential for water pollution through stormwater runoff and aquifer infiltration. Proper design and operation of aerobic and enclosed (anaerobic) systems can overcome these problems. In general, co-composting is currently in the experimental stages in the U.S. despite extensive use in Europe and relatively little is known regarding full-scale plant operations.

Selection of RDF

Advantages*

RDF installations shred, then classify waste into combustible and noncombustible fractions. By classifying materials before incineration, the noncombustibles can be separated into distinct fractions such as ferrous metals, aluminum and glass. These classified fractions will be relatively pure compared to mass-burn incinerator residue and, therefore, will contribute to higher salvage and heating values.

The RDF has a lower ash content, a higher heating value, and a slightly lower moisture content than unprocessed refuse (mass-burn). It can be further treated to form a fluff, a powder, or briquettes. The RDF can be incinerated on-site or transported to an existing fossil-fuel-facility and can be burned by itself, or as a fuel supplement to coal or oil. The potential for flexibility is one of the major advantages of the RDF process.

Metals, glass, paper and plastics can be removed from the solid waste stream for recovery and resale. The prepared fuel is compact and can be transported for incineration off-site. RDF plants typically have a lower capital cost and comparable operating costs when compared to other similar sized alternative processing plants.

Several facilities are operational in the U.S. and have operated very reliably for a number of years. Although some concern has been expressed regarding maintenance of these facilities, it is believed that most of the major technical problems have been resolved. With respect to thermal efficiency, the RDF process is superior to mass-burn and comparable to that of pyrolysis (an as yet unproven technology). There are several vendors with the expertise to develop and operate an RDF facility in a reliable and cost-effective manner. Environmental impacts appear to be very similar to those of mass-burn facilities. The savings in capital costs and increased flexibility are deemed to be the major advantages.

*State of N.J. incinerator Study, Vol. III; Technical Review and Regulatory Analysis of Municipal Incineration; Nov. 1982; GCA Corp., Bedford, Mass.

Disadvantages

RDF plants require extensive fuel preparation equipment, which is both costly to buy and to operate. RDF boilers experience loss of material and heat value in precombustion and combustion processes. Additional costs are incurred if the RDF is transported off-site for incineration. In the past, there has been some question regarding the reliability of RDF processes. This disadvantage appears to have been addressed and it is believed that reliable operations are being and can be achieved.

Related Local Reasons for Preferring RDF To Mass-burn Technology

The impetus for Ramsey and Washington Counties to implement a waste recovery project is to abate the landfilling of the wastes generated within their boundaries and maximize materials and energy recovery. The mass-burn facility would have been located and sized to provide steam energy to 3M. 3M did not desire enough energy to require the bulk of the average level of MSW generated on a daily basis in the counties. Furthermore, the combination of declining prices over the past two years for alternative fuels available to 3M and the initially more capital intensive nature of the operation have eroded the financial feasibility of the project. Consequently, the counties opted to pursue the RDF approach, but would implement a mass-burn project if RDF technology proves to be unacceptable.

Conclusion

Although the mass-burn process has been proven to be a reliable and effective technology, several inherent disadvantages have resulted in the selection of the alternative RDF process. In particular, the mass-burn technology involves the largest capital cost and the least flexibility regarding the use of the resultant fuel. The lack of flexibility in fuel use would prevent the counties from sizing a mass-burn facility large enough to achieve maximum landfill abatement and materials and energy recovery. The pyrolysis and co-composting alternatives are not believed to be developed to a sufficient degree to warrant serious consideration as the primary technology for a large-scale operation. Both processes are essentially in the experimental stages. No large-scale facilities in the U.S. are currently operating using the pyrolysis technology and only two are based upon co-composting. RDF processing has proven to be a commercially viable technology in the U.S. About 20 percent of all resource recovery facilities in the U.S. use the RDF processing technique. The initial capital costs are low and considerable flexibility regarding the use of the resultant fuel exists. Of particular attractiveness is the fact that the RDF fuel can be burned in existing boilers.

LOCATION

The project represents the culmination of more than five years of planning that has prudently and effectively eliminated alternatives to the proposed site. When the mass-burn project was planned, a number of site alternatives were evaluated to select an acceptable one that best minimized MSW delivery expense as well as energy and product transportation costs and ash disposal effort. Then the mass-burn technology was eliminated because of declining prices for optional fuel sources and limitations on the amount of landfill abatement that would result. This background gave the county sponsors and potential developers a thorough understanding of the planning considerations relevant to delivery of MSW and requirements for RDF production and transport of the various outputs to markets. Based on this understanding, a competitive process was established to select the most suitable RDF processing technology and site.

The competitive process for RDF technology and site selection was rigorous and relied upon the extensive site review criteria listed in Table 2. The EIS is required to evaluate alternative sites including those rejected and potential sites not considered. The competitive selection process resulted in two contenders, the proposed site and a similar sized property about a quarter mile to the north, between Maxwell Rd. and the Mississippi River.

These two sites are outstanding in view of the importance of accessibility for an operation that is heavily dependent on incoming and outgoing delivery of heavy materials. Not only are they accessible to Hwy. 61 and I-494, they are adjacent to or in the close proximity to rail and barge routes. It is readily apparent from Figure 2 in the Project Description chapter that no other vacant land is available nearby that is both accessible to the transportation routes and shielded from residential development. The NSP electrical transmission substation between the sites offers additional future potential for construction of an incinerator facility that could use RDF to produce electrical energy and thereby eliminate off-site transport of RDF.

Earlier site evaluation in conjunction with the mass-burn proposal involved 11 sites. An additional 14 potential sites were studied by Council staff. Only a few of these sites survived the site review criteria in Table 2 and are somewhat accessible to the freeway system. The Lake Elmo site initially proposed for the mass-burn project is the most advantageous of these sites for a waste processing facility.

Consideration could be given to a site further south near Hwy. 61 in Cottage Grove that is being considered for a General Motors automotive manufacturing plant. A boiler suitable for combustion of RDF could be constructed there to accommodate its energy needs. RDF hauling would be eliminated and delivery distances for MSW and processing outputs other than the RDF would be marginally increased. The uncertainty that an automotive plant will be approved for this site and the timetable for its planning and development would, however, delay the achievement of the counties' landfill abatement goals too long for this option to be considered feasible now.

Viable Alternatives

Two alternatives to the proposed sites should be evaluated. These are the initial mass-burn site, which will hereafter be referred to as the Lake Elmo site, and the previously competing site, referred to as the Aenco site in deference to its corporate owner.

Table 2
DETAILED REVIEW CRITERIA

Feasibility	Preferred sites have a minimum of 10 acres for site development.
Cost	Preferred sites minimize site costs. Preferred sites minimize the distance required for a steamline. Preferred sites minimize construction or upgrading of roads for access. Preferred sites minimize the distance to existing electrical and sanitary services.
Visual	Preferred sites minimize visual impacts on residences.
Agriculture	Preferred sites minimize consumption of prime agricultural land (SCS types I and II).
Noise	Preferred sites minimize traffic noise on residential areas. Preferred sites minimize construction and operating noise impacts on residential and other noise sensitive areas.
Historical/Archaeological	Preferred sites minimize impacts on historical and archaeological resources.
Fish and Wildlife	Preferred sites minimize impacts on rare, endangered and threatened plant and animal species.
Water Quality	Preferred sites minimize water quality impacts on lakes, ponds, rivers, streams and marshes.
Air Quality	Preferred sites minimize the potential for cumulative impacts with other major air emission facilities.
Recreation	Preferred sites minimize impacts on federal, state, county or local recreation or open space areas.
Zoning	Preferred sites minimize impacts on local zoning.
Planning	Preferred sites are compatible with existing land use plans.
Geology	Preferred sites are not located in geologically unstable areas such as fault zones, shrink-swell soils, peat lands or sink holes.

Table 2 (Cont.)
DETAILED REVIEW CRITERIA

Vegetation	Preferred sites minimize impacts on forest and woodland resources.
Hydrology	Preferred sites minimize: a) drainage or runoff to water courses; b) shoreline alterations; c) dredging and filling; and d) channel modifications.
Steamline Impacts	Preferred sites minimize potential impacts associated with routing, construction and operation of a steam line.
Haul Distance	Preferred sites minimize the haul distance.
Future Steam Users	Preferred sites are near future steam users.
Traffic Congestion	Preferred sites minimize impacts on traffic congestion.
Airports	Preferred sites minimize impacts on airport approach patterns.

NSP has prepared a "Ramsey/Washington Counties Waste To Energy Project Position Paper" (dated Oct. 8, 1984) dealing with site selection. It evaluates the proposed site relative to the Lake Elmo site. The significant differences leading to the selection of the proposed site are described below.

The Lake Elmo site would be more expensive and industrial development would have a negative impact on nearby properties. Substantial upgrading of the local road network would be necessary. Electrical service is not as readily available but less sanitary sewer installation work would probably be necessary. Industrial changes in the character of the site with its natural hills and wetlands would be visually apparent from nearby residences, whereas the Newport site is remote from residential development and screened by industrial and traffic barriers. The Lake Elmo site is more viable for agriculture.

Traffic and construction noise could be detrimental at the Lake Elmo site while this impact would be attenuated and masked by other noise generators in Newport. No known rare or endangered plant or animal species have been identified on either site, but the previously undeveloped Lake Elmo site offers more prospects in this regard. Air quality and noise impacts from truck traffic can be mitigated with the feasible rail or barge alternatives available in Newport.

Rezoning from rural residential to industrial status would be necessary in Lake Elmo, but no change in Newport plans is needed. Organic soils in Lake Elmo may result in higher construction costs than in Newport with bedrock just below the surface. The Lake Elmo site poses no special hydrology problems like the floodplain issues that must be addressed in Newport. In terms of haul distances, the Lake Elmo site is not only six miles further from the RDF user and further from potential landfill sites, it does not provide the opportunity to develop alternative transportation capabilities.

The Aenco site is very similar to the proposed site. It contains similar geologic, hydrologic and habitat characteristics. It would be somewhat more costly to extend roads and sewers an additional quarter mile. It is more visible to residential homes and I-494 does not shield it as well. Zoning and planning considerations would be essentially identical. Differences in haul distances and accessibility to transportation systems would not be material. Except as noted, the Aenco site is considered to be equivalent to the proposed site as an alternative for the proposed development.

The proposed site is superior to the Lake Elmo site in almost every significant respect. For an RDF facility, the Newport location and environmental constraints are preferable to the best potential site for another viable type of resource recovery facility. Within Newport, the Aenco site is almost equally well suited for project development and is the only viable alternative.

NO-BUILD

The purpose of the proposed RDF facility in Newport is two-fold: to provide solid waste disposal for Ramsey and Washington Counties and to increase the recovery of materials and energy. If the facility is not built, other methods will be needed to dispose of at least 1,000 tons of solid waste per day or to recover material and energy values. The fall-back plan of a 600 TPD mass-burn plant would leave an additional 400 plus TPD requiring disposal if the RDF project is not implemented.

The no-build option is limited by several factors. For solid waste disposal, the feasible options are constrained by the current waste disposal system and the counties' waste abatement plans. Markets for recovered materials and energy products, as well as the environmental impacts of various alternative fuel sources, restrict the ability to implement other comprehensive solutions.

Waste Disposal Options

Currently, the vast majority of solid waste in Ramsey and Washington Counties is disposed of in sanitary landfills. Neither county, however, currently has sanitary landfills operating within its boundaries. Waste in Ramsey County most often goes to landfills in Anoka and Dakota Counties while that in Washington County usually goes to landfills in Dakota County, Chisago County and St. Croix County, Wis. The counties will not be able to rely on the existing system much longer. The Metropolitan Council estimates that existing landfill capacity in the Twin Cities region will be exhausted during the 1990s.

State legislators recognized the need to change the current land disposal system in the Waste Management Act of 1980. Two of the principles embodied in the Act are: 1) that the counties be responsible for waste disposal, and 2) that land disposal of wastes be minimized. The act provides for counties to develop and implement waste abatement proposals to decrease land disposal, and to site and implement landfills if abatement is not feasible.

The proposed project will assist the counties in implementing the legislative mandate. The counties will be responsible for a greater portion of their own waste disposal and will help decrease the need for landfills. The project, however, comprises just one element of the counties' abatement strategies. Each county has proposed a mixture of additional abatement strategies including waste reduction, recycling, and composting/co-composting.

Washington County plans to reduce waste volumes by evaluating procurement policies, developing a public information campaign and office paper reduction program, and encouraging appropriate state and federal legislation. It will initiate recycling programs aimed at: 1) public education; 2) commercial recovery of materials such as corrugated cardboard and office paper; and 3) residential recovery through curbside pick-ups, cooperative marketing and possibly, an industrial park emphasizing recycling businesses. Both backyard leaf waste composting and centralized municipal composting are also a part of the county's plans. Co-composting of MSW with sewage sludge is the county's final abatement strategy. It has expressed the intent to conduct studies on the feasibility of co-composting at the Cottage Grove and Stillwater wastewater treatment plants, and will work with St. Paul, Ramsey County and the Metropolitan Waste Control Commission (MWCC) on feasibility studies for a Pig's Eye Metro Plant co-composting demonstration project.

Ramsey County's programs address much the same areas as Washington County's. Ramsey County will try to reduce waste volumes through county procurement policies, office paper reduction programs, and public education. It also plans to institute a countywide curbside recycling program and recycle office paper. Yard waste composting will be encouraged, both at centralized sites and in backyards. Leaf waste composting sites and free distribution of leaf waste compost are elements of the plan. Finally, the county will participate with St. Paul and the MWCC in further analysis of a co-composting project at the Pig's Eye Metro Plant.

Neither of the counties' abatement proposals will entirely eliminate the need for landfills--ash from RDF combustion and unrecovered waste materials will still need to be disposed of. It is doubtful that more than a single landfill will be developed by the counties prior to the year 2000. Ramsey County has no potential sanitary landfill sites in its inventory and Washington County has only one.

Both counties have outlined contingency plans that will go into effect if the waste-to-energy project is not built either as an RDF or a mass-burn operation. Washington County plans to co-compost about 90 tons of solid waste per day (28,000 tons per year) in Stillwater and Cottage Grove, and to consider taking part in the co-composting project at the Metro plant in St. Paul. The magnitude and probable chances of success of the Metro plant project, however, are uncertain. Feasibility studies did not lead to firm commitments by any of the participating agencies, although some aspects are still being analyzed. If the Metro Plant project is found infeasible, and if the Cottage Grove and Stillwater projects are too, then there would be greater reliance on land disposal--more landfills would have to be developed.

Ramsey County's contingency plan initially follows the same track as Washington County's--possible co-composting at the Metro Plant in the event the waste-to-energy project is not built. Modular incineration would be reinvestigated. If co-composting and the waste-to-energy options are not found viable, the county may develop a waste transfer/processing station to facilitate waste transport to landfills or resource recovery plants outside the county.

Conclusion

The counties plan to reconsider the mass-burn option if RDF development is not implemented. This option, even in conjunction with the additional waste abatement strategies potentially available, is not likely to comprehensively and promptly address the abatement problem. The annual impacts on the waste stream of the various possibilities may be instructive.

The most optimistic goal for waste reduction and source separation of waste materials in the counties is 20 percent or almost 100,000 tons per year of the nearly 500,000 tons generated. This goal will be pursued even if the RDF facility is built. The mass-burn option will process approximately 188,000 TPY as compared with the 313,000 TPY basic operational level of the RDF project. The only other identified treatment option might process 28,000 TPY leaving a processing shortfall of approximately 100,000 TPY that is not likely to be promptly addressed if attention is concentrated on mass-burn implementation. Landfill abatement success will be relatively limited if the RDF project is not built.

PROJECT SIZE

The Council contracted with Environmental Resources and Technology, Inc., to analyze project size alternatives. The document containing the analysis was incorporated by reference in the EIS Executive Summary. This section summarizes the size options analysis.

The primary objective of the RDF proposal is to economically minimize the need for the land disposal of Ramsey and Washington Counties' solid waste. With this objective in mind the following discussion evaluates three potential RDF facility sizes in terms of their ability to handle the wastes projected for the present and future.

The three facility sizes were determined by the number of 50 tons per hour processing lines. It was assumed that the sizes are based on one, two and three processing lines capable of operating 16 hours per day, six days per week and 52 weeks per year. Therefore, the three potential RDF facility sizes have the following processing capacity sizes; 249,600 tons per year (TPY) or about 800 tons per day (TPD) capacity, 499,200 TPY or 1,600 TPD capacity and 748,800 TPY or 2,400 TPD capacity.

It has been estimated that 492,800 TPY of solid waste were generated annually in Ramsey and Washington Counties in 1980. However, this is not the amount of waste that will be sent to an RDF facility for processing. Both counties encourage recycling of residential, commercial and industrial wastes and are expected to continue to do so. This applies especially to the recycling of residential wastes through such programs as curbside collection services and drop-off facilities. Composting of yard wastes is another aspect of the counties' waste treatment strategy. Separate collection of bagged leaves and grass clippings will facilitate composting of these organic waste materials, thereby removing them from the RDF process stream. The removal of all available recyclables and yard wastes via source separation is estimated to decrease the 1980 waste generation quantity by 102,664 tons. This would still leave 390,135 TPY that could be processed by an RDF facility. This figure translates to 1,250 TPD for a 312 day per year operating schedule.

Scenario 1 - One Line

Scenario 1, which is one 50 ton per hour processing line, has the capacity to treat 249,600 tons per year. Since the amount of waste to be treated exceeds this capacity, it is assumed that the facility will be operated continuously at its rated capacity. For this scenario there is no excess capacity. In fact the facility has a "capacity shortage" of 140,535 TPY, and this waste must be landfilled without treatment (See Table 3).

Treatment of the 249,600 TPY in the RDF facility will result in the separation of metals for recycling (eight percent of total), residue which is landfilled (22 percent), RDF for combustion in the NSP boilers (70 percent), and ash from RDF processing, which must be landfilled (10 percent of the RDF value). The amount of waste to be landfilled then can be calculated by adding the amount of waste not processed in the facility (140,535 TYP), the residue (54,912 TPY) and the RDF ash (17,472 TPY). This amount equals 212,919 TPY. When compared to the total amount of waste available to the RDF facility, 390,135 TPY, a 45.42 percent reduction in the weight of material sent to the landfill is noted.

It is noted that 605 acre feet of landfill will be required if the 390,135 TPY of waste are not treated at all. Treatment in an RDF facility reduces this land space requirement in two ways. First, the amount of RDF that is generated does not require landfill space. Second, the residue and RDF ash that do require land disposal are much more dense than the raw waste, and require less space (volume) per ton than does a similar amount of waste. Consequently the reduction in land space requirements (volumetric reduction) noted when an RDF facility is used, is even greater than the weight reduction previously discussed.

In spite of the weight and volume reductions noted, Scenario 1 is undersized relative to the disposal needs of Ramsey and Washington Counties. At maximum capacity it could process only 64 percent of the waste sent to it in 1988, and this figure drops to 60 percent by the year 2000 as the amount of waste generated increases. Use of a one-line RDF facility would require the counties to actively pursue additional means of reducing annual land disposal requirements. These methods might include additional recycling and/or composting of industrial and commercial waste, a mass-burn facility, co-composting waste and sewage sludge, pyrolysis of waste to produce liquid or gaseous fuels or biological processing to produce liquid fuels such as ethanol. However, there are potential problems associated with the application of these alternatives. For example, pyrolysis and biological processing of solid waste to produce fuel are still experimental processes. Additional recycling and composting requires active and voluntary participation by the commercial and industrial sectors as well as the public. Co-composting of solid waste and sewage sludge is a promising technology, but one that requires additional research and the development of an end use market for the soil conditioner that is generated by this process.

The use of a one-line RDF facility will substantially reduce the solid waste landfill requirements of Ramsey and Washington Counties. However, it will not, in itself, minimize the amount of landfill capacity required by the counties. Adoption of this scenario would still require an additional commitment, in cost and manpower, to promote other alternative techniques for minimizing landfill requirements.

Scenario 2 - Two Lines

Scenario 2 is based on the use of two parallel 50 ton per hour processing lines. The facility would have a maximum rated capacity of 1,600 TPD or 499,200 TPY when utilized at the prescribed operating rate. Examining the solid waste data calculated for Baseline Conditions (based on 1980 data) it is noted that the facility would be large enough to handle all of the waste fed to the RDF facility and still have an excess capacity of 109,065 TPY, or roughly 28 percent. Since the facility can potentially accommodate all of the solid waste received, the only solids that remain after processing are the residue and the RDF ash, 113,139 TPY. Therefore, on a weight basis, a 71 percent reduction in the weight of waste sent to the landfill is achieved (See Table 3). The excess capacity of the facility drops to 22 percent by the year 2000 as the amount of waste increases. The percentage reduction in weight remains the same. Potentially, the output that is landfilled will only be dense residue or ash, and the reduction in required landfill space is greater than the reduction in weight.

The two-line facility offers several advantages over the one-line operation. Significant additional reductions are achieved in the weight of waste that must be landfilled and the volume of landfill space that is required for this waste.

TABLE 3
SOLID WASTE REDUCTION - BASELINE (BASED ON 1980 WASTE GENERATION)

Scenario #	Capacity (tpy)	Waste Process Rate (tpy)	Excess Capacity (tpy)	Metals Recycled (tpy)	Residue (tpy)	RDF (tpy)	Ash (tpy)	Solid Waste to Landfill (tpy)	Solid Waste Reduction (% by Weight)
1	249600	249600	(140535)	19968	54912	174720	17472	212919	45.42
2	499200	390135	109065	31211	85830	273094	27309	113139	71.00
3	748800	390135	358665	31211	85830	273094	27309	113139	71.00

Assumes RDF Facilities operate 6 day/week, 52 week/yr.

Waste generated from both counties = 492800

Waste generated for RDF processing = 390135

Scenario #1 based on one 50 ton/hr process line.

Scenario #2 based on two 50 ton/hr process lines.

Scenario #3 based on three 50 ton/hr process lines.

Source: ERT, 1985

The facility may have enough excess capacity to handle the wide daily and seasonal fluctuations that are observed with solid waste disposal, without the need for additional on-site waste storage. More capacity utilization could be achieved than the 1,000 ton per day MSW volume specified for project operation by extending the 10-hour per day processing schedule when warranted by MSW supplies. The excess capacity also provides a margin of safety should the residential recycling and waste composting programs not experience the degree of participation that is anticipated. The excess capacity may also provide a reserve if the amount of commercial and industrial waste that is handled is more than expected. In addition, a two-line facility reduces the reliance on other solid waste disposal options such as co-composting that may be required if only one RDF process line is installed.

In summary, a two-line facility provides sufficient capacity to handle current and projected future solid waste disposal needs. It minimizes the amount of landfill space required for solid waste disposal and allows for the variations in waste generation rates that are common to solid waste processing facilities.

Scenario 3 - Three Lines

Scenario 3 assumes the use of three 50 ton per hour processing lines. This facility would have a maximum rated capacity of 2,400 TPD 748,800 TPY. This facility could process all of the waste available to it and still have substantial excess capacity. This excess capacity would amount to 91.9 percent of the waste treated in 1980 (See Table 3). In addition, since the two-line design includes some excess capacity, the three-line facility would not process significantly more county waste than the smaller design. Consequently the amount of residue and ash generated by the three-line design is equivalent to the amount for a two-line facility, as is the reduction in the weight of solid waste that must be landfilled. This comparability in waste processing data between Scenarios 2 and 3 would not be affected by the potential for increased waste generation by the year 2,000.

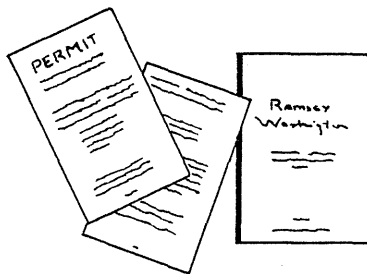
When compared to a two-line facility, a three-line RDF operation would provide no additional reduction in the amount of land space required for disposal of the residue and ash that remains after RDF processing, the third line is a redundant processing operation unless additional waste is committed from other surrounding counties. While this additional line provides operational flexibility, the cost of this flexibility must be weighed against the advantages it may provide. For example, if a three-line operation is installed, one complete line could be maintained as a stand-by and only used during equipment malfunctions or other unscheduled outstages. Conversely, the facility operating schedule could be modified to have all three units operating simultaneously for 10 hours per day, five days per week for 52 weeks per year at maximum capacity.

A three-line facility would allow for the daily and seasonal fluctuations associated with solid waste generation and for lower than expected public participation in the recycling and composting programs. The project could seek additional supplies of solid waste to gain an economic return from reserve capacity. The wastes of other neighboring counties and/or additional industries would increase the utilization rate.

The project is designed with space for a third processing line. This flexibility may allow Ramsey and Washington Counties to assist nearby jurisdictions with their waste disposal needs in the future. If RDF production exceeds NSP's boiler capacity, the promising co-composting technology could be explored. Little capital investment would be necessary because excess RDF would be combined with sewage sludge from the nearby Pig's Eye Sewage Treatment Plant. Market development, perhaps the most significant uncertainty constraining co-compost implementation, could be experimentally addressed prior to the installation of a third processing line.

In summary, a three-line facility could add to the administrative and economic problems of the project without producing a tangible benefit in terms of a reduction in solid waste landfill space requirements when compared to the two-line design. If no additional sources of waste are found, the facility would cost more at this time, on a per ton of waste basis, than the smaller design.

PERMITS AND APPROVALS



PERMITS AND APPROVALS

EIS PURPOSE

The purpose of this EIS is to disclose information about the significant environmental impacts of a proposed action. The document is not intended to justify either a positive or negative decision on the project, but can be used as a guide in issuing or denying permits or approvals for the project and in identifying measures necessary to avoid or mitigate adverse environmental effects and to restore or enhance environmental quality.

Table 4 lists permits and approvals which are or may be required for the project to be successfully implemented.

RECORD OF DECISION

For the permitting and approval decisions listed in Table 5, the EIS must be utilized. These permitting/approval agencies are required to provide a record of decision stating how the pertinent information in the EIS was used in reaching their decisions. The record must be provided to the Environmental Quality Board and any other person that requests the information.

Table 4
RAMSEY/WASHINGTON COUNTY WASTE-TO-ENERGY PROJECT PERMITS AND APPROVALS LIST¹

<u>Permit/Approval</u>	<u>Agency</u>	<u>Authority</u>	<u>Approximate Time for Preparation and Review</u>	<u>Filing or Inspection Fees</u>	<u>Comments</u>
<u>Federal</u>					
Permit to discharge dredge or fill materials in U.S. waters	U.S. Army Corps of Engineers	Clean Water Act, Ch. 404	3 months	\$100-Public agencies exempt	Includes discharges into wetlands.
FAA Obstruction analysis	Federal Aviation Administration	14CFR77	3 months		Applies to any structures over 200 feet high or within restricted airspace near airports. Sets standards for structure lighting.
<u>State</u>					
Air emission facility installation and operation permits	Minnesota Pollution Control Agency (MPCA) Air Quality Division	M.S. Sect. 116.081; Federal Clean Air Act; and regulations thereunder.	6 months		May not be required because emissions will only occur from the building's heating plant and fabric filter dust collector charges. Includes prevention of significant deterioration review. The Council has joint approval authority.
Solid waste facility approval	MPCA Solid and Hazardous Waste Division	M.S. Sect. 116.081; Federal Resource Conservation and Recovery Act; and regulations thereunder.	6 months		Concurrent with air emissions permitting. Specifies conditions to control dust, noise transportation and materials management.
Sewer extension permit	MPCA and City of Newport	MPCA rule; WPC 36 and Newport sewer systems ordinances.	1 month	\$ 25 (city)	
Water appropriation permit	Department of Natural Resources	M.S. Sect. 105.41	4 months	\$ 15	Required for appropriations of 10,000 gallons or more per day, or 1 million gallons or more per year. Applies to construction dewatering or commercial wells.
Utility permit	Department of Transportation	M.S. Sect. 161.45	3 months	\$ 25 per crossing	Required for utility lines to use or cross federal or state highway right-of-way.
Plumbing approval	Department of Health	MCAR 39A/Rule MHD 134	3 months		May also be made by local government.
Public water supply approval	Department of Health	M.S. Sect. 144.383	1 month		For systems serving 25 or more persons per day, 60 or more days per year.
Electrical installation approval	Board of Electricity	M.S. Sect. 326.244	Inspection on request.	\$100+	

Table 4 (Cont.)
 RAMSEY/WASHINGTON COUNTY WASTE-TO-ENERGY PROJECT PERMITS AND APPROVALS LIST¹

<u>Permit/Approval</u>	<u>Agency</u>	<u>Authority</u>	<u>Approximate Time for Preparation and Review</u>	<u>Filing or Inspection Fees</u>	<u>Comments</u>
Designation of waste flow	Waste Management District or counties make designations	Waste Management Act M.S. Sect. 115A.70	9+ months		Time estimates subject to substantial variation due to public hearing and waste management planning requirements. Metropolitan Council has approval authority.
<u>Local</u>					
Industrial discharge permit	Metropolitan Waste Control Commission	Clean Water Act; M.S. Sect. 473.501	5 months	\$30 to \$180	Discharges must be compatible with system. Discharge fees vary with nature and quantity of discharge. Pretreatment may be required.
Drainage permit	Ramsey/Washington County Metro Watershed District	MN Watershed Act Sect. 112.43	2 months		Applies only if DNR protected wetland restrictions are not applicable.
Solid Waste Processing Facility	Washington County	Washington County waste ordinances	6 months	\$ 1,400	Concurrent with PCA review, annually, thereafter.
Conditional use permit	Newport zoning/building department; city council	Newport zoning ordinances	6 months		Current zoning is industrial.
Building/construction permits	Same as above.	Newport building ordinances	--- ²	\$10,000 estimated	Wells must meet Health Department requirements. Fire protection systems must meet fire code requirements. All applicable codes and ordinances must be met.

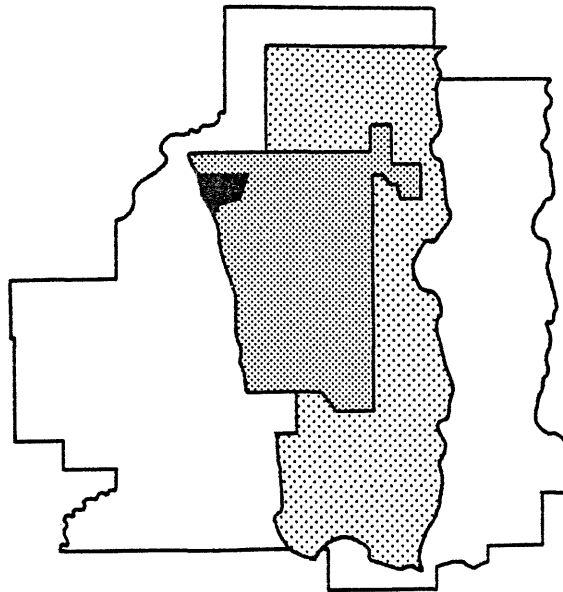
¹The permits and approvals stated here are only for matters relating to the design, construction and control of waste. Other regulatory requirements such as those relating to bonding and financial matters are not included.

²Permits are issued upon completion of construction plans and plan review. Required inspections and approvals must be made upon completion of construction.

Table 5
PERMITS AND APPROVALS REQUIRING A
RECORD OF DECISION

<u>Agency</u>	<u>Permit/Approval</u>
MPCA	Air Quality Construction Permit and concurrently Solid Waste Facility approval
Mn/DOT	Utility Permit
Metropolitan Council	MPCA Solid Waste Facility approval
Newport	Zoning approval (conditional use)

CONSISTENCY WITH LOCAL AND REGIONAL PLANS



CONSISTENCY WITH LOCAL AND REGIONAL PLANS

Plans of the city, counties and the Metropolitan Council should be considered to identify the potential for planning related impacts on the project. Several different Newport plans affect the project as well as the county solid waste management master plans and the Metropolitan Development Guide.

NEWPORT PLANS

The Newport Development Guide Plan designates the site vicinity as industrial. A Newport zoning map is provided as Figure 9. The comprehensive plan also contains goals and policies with respect to the visual quality of new development and related recommendations of the city will be provided to the developers. The project will comply with all aspects of the Newport Critical Area Plan provided that the final grading plan is in accordance with the floodway, floodplain, and floodfringe requirements. Design and grading plans will be finalized during the building permit process. The project is consistent with the Newport Development Guide Plan, Zoning Plan and Critical Area Plan.

COUNTY PLANS

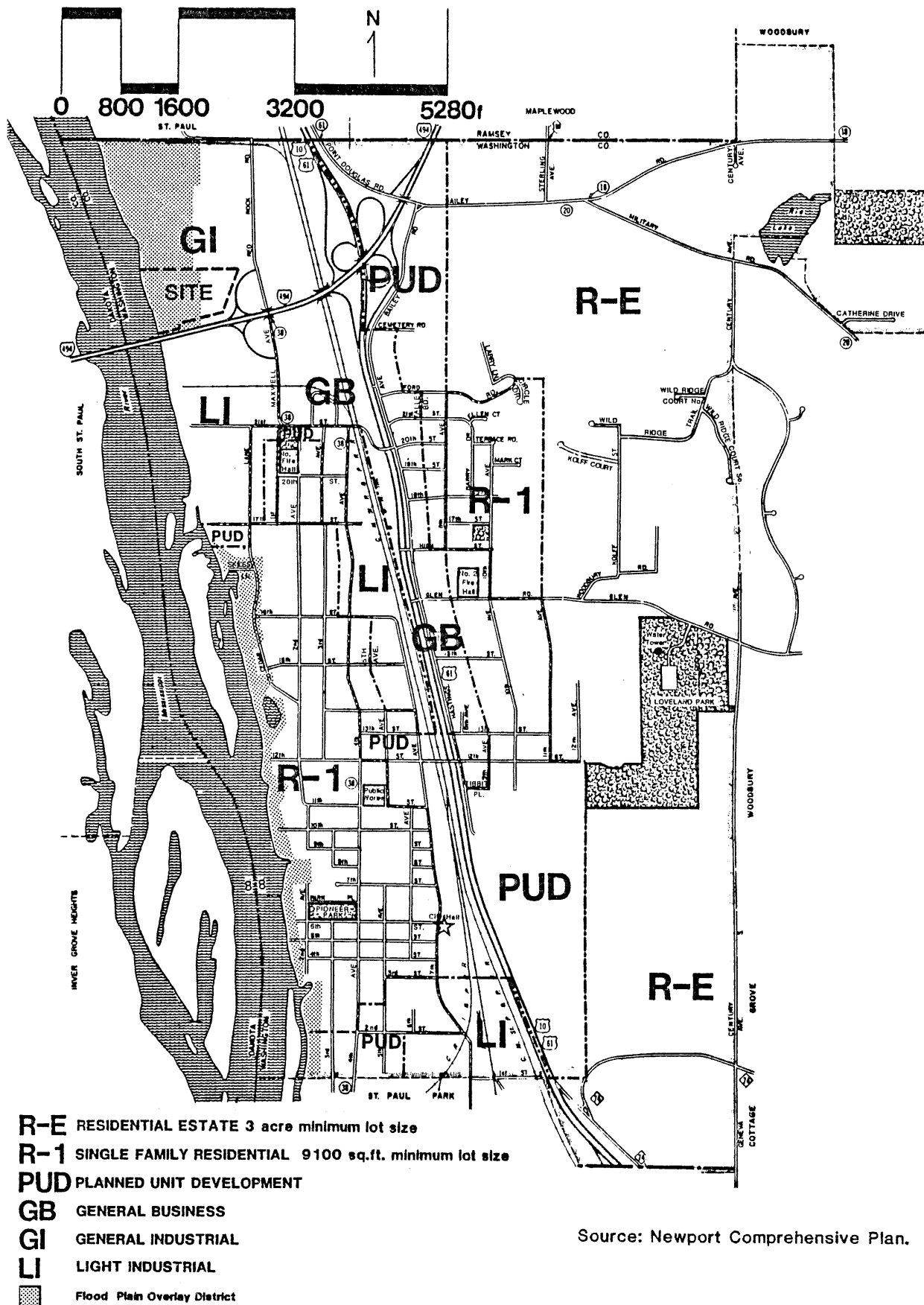
The Ramsey County Solid Waste Management Master Plan identifies the amount of new landfill capacity the county will need if current waste disposal trends continue. Four major strategies were adopted to reduce the need for more landfills. The strategies address "waste reduction, waste separation, landfill and resource recovery." The resource recovery strategy calls for a facility feasibility study and participation in implementation if a proposed facility meets county criteria and standards. The St. Paul Waste-To-Energy study, which was the impetus for the current proposal, is referenced. The county committed by policy to support private industry development and implementation to the extent possible. The Ramsey/Washington Project is consistent with the Ramsey County Solid Waste Management Master Plan.

The Washington County Solid Waste Management Master Plan contains a strategy that is similar to Ramsey County's. Its primary goal is to decrease the need for land disposal of MSW. A comprehensive management system is to be implemented relying, in priority order, upon waste reduction, source separation, waste processing for materials and energy recovery, and land disposal of residuals. The county also committed itself to cooperation with other counties in implementation efforts. The Waste-To-Energy project is discussed in detail as a major component of the county waste management strategy. The project is clearly consistent with the Washington County Solid Waste Management Master Plan.

METROPOLITAN COUNCIL PLANS

The Metropolitan Development Guide contains the Metropolitan Council's policies regarding regional systems and other concerns that affect orderly and economic development. The Development Framework focuses on the appropriateness of proposed development in terms of competing needs within the region for urban amenities and rural preservation. The regional system plans for highways, airports, parks and sewers, provide additional insights that may apply. In this case, the Council's Solid Waste Management Policy Plan, another chapter of the Development Guide, is directly applicable as well.

Figure 9. ZONING MAP, CITY OF NEWPORT



Source: Newport Comprehensive Plan.

From a Metropolitan Development Framework perspective the site is outstanding. It is located within the Metropolitan Urban Service Area and is accessible to the regional systems, particularly the interstate highway network.

The capacity of the regional highway system is not likely to be significantly affected by the proposed project. The volume of traffic associated with the project near the site will be low during "peak-use" hours. Heavily loaded trucks will affect road wear and safety and these issues are discussed in the chapters on "Provision of Urban Services" and "Sociological Impacts."

The regional airport system will not be affected by the project. The site is more than four miles southeast of Holman Field in St. Paul and the height of the plant poses no problem for aircraft. Potential requirements for warning lights to alert pilots are identified in the "Permits and Approvals" chapter.

The site is not near a component of the Regional Parks and Open Space System and no impacts are anticipated.

The project is not likely to adversely affect the regional sewer system. The Newport owned sewage collection system did have a limited capacity restriction in the past. The city installed oversized pumps to deal with this water infiltration problem. City officials do not perceive a need for mitigation measures to provide capacity to accept the sewage flow anticipated from the central sewer line that will be installed to service the project and adjacent properties.

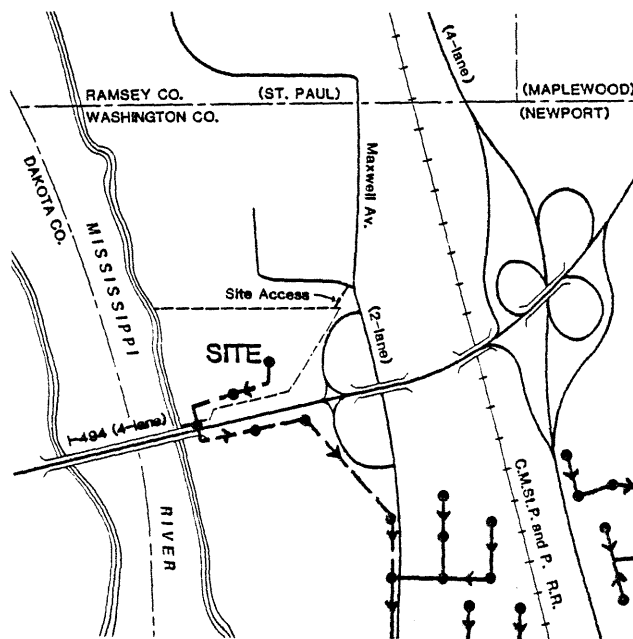
Facility plans show in-line oil traps, separators and settling tanks as necessary to meet Metropolitan Waste Control Commission rules and regulations for wastewater discharge to the sewage system. These appear to be adequate to prevent problems from wastewater discharge. If the wastewater is of high strength, the MWCC may add a surcharge to the regular charge for service to cover its additional expenses or it may prescribe corrective measures.

The Council's Solid Waste Management Policy Plan is expected to be amended prior to the publication of this EIS. Consequently, the project was reviewed for consistency with both the current plan and the proposed draft. The plan is intended to coordinate efficient and economic solid waste disposal in the region in order to control air and water pollution and thereby protect public health and safety. The revised plan calls for a regional system of coordinated processing and recycling services with the counties assuming the major responsibility for implementation. In conjunction with waste reduction, source separation and facility processing initiatives, the termination of land disposal of MSW is mandated by 1990. Only nonrecoverable residuals from waste processing facilities should be landfilled after that date.

The Ramsey/Washington RDF facility will help implement the policies in this plan. It will reduce the region's dependence on land disposal and maximize the recovery of energy and materials from MSW. Ramsey and Washington counties will be shouldering their responsibilities for centralized processing by the established target date (1987) in the Waste Reduction/Resource Recovery Development Schedule. The potential for compacting and landfilling waste that exceeds normal operating and storage capacities, however, will have to be addressed by 1990 when land disposal of MSW must be terminated. Extra processing hours and co-composting are options that should be explored in the future to avoid land disposal of MSW.

In summary, the facility is compatible with planned metropolitan systems. The site and facility are consistent with regional solid waste management policies as well.

PROVISION OF URBAN SERVICES



PROVISION OF URBAN SERVICES

The project will require transportation system access, electricity, water, wastewater disposal, and public safety services. Electricity will be transmitted from the adjacent NSP electrical generation substation. Water will be provided through a well and associated storage and pumping system that is described in more detail in the chapter on Plant Safety and Management. Public safety services will primarily be provided by the city of Newport. Emergency fire response is of critical importance and this capability is also discussed in the Plant Safety and Management chapter. Transportation and wastewater disposal planning are reviewed below. Transportation implications of a more general nature are discussed in the chapter on Sociological Impacts.

TRANSPORTATION

Washington County plans to upgrade 400 feet of Maxwell Rd. near the facility. Bypass lanes will be installed at the ramps to and from I-494 and at the facility entrance where a center turn lane will also be added. These improvements are expected to minimize interference from facility related traffic.

The Minnesota Department of Transportation (MDOT) plans to reconstruct the I-494 interchange with Maxwell Rd. during the 1990's. It estimates that project related traffic will add 1.4 million equivalent single axle loads (esal's) per year on the I-494 ramps at Maxwell and 2.0 million esal's on Maxwell Rd. from the northern ramp to the facility entrance. These esal volumes should be considered to properly design new road surfaces for a 20-year life with the increased volume of facility traffic. The esal figures are for concrete pavement. The corresponding levels for bituminous surfaces are .925 million for the ramps and 1.3 million for Maxwell Rd.

WASTEWATER

Washington County plans to install an eight-inch forcemain sanitary sewer line from Newport to serve the facility as well as the Red Rock NSP substation and other properties along Maxwell Rd. Newport has had sewer capacity limitations in the past associated with water infiltration into its sewer lines, primarily during wet springtime periods. City installation of oversized pumps is believed to have eliminated this problem but other improvements could be required to provide an assurance of sewer capacity.

Within the facility site, the sanitary sewer system will consist of underground piping to gravity-feed all sewage from the administration building and the process building to the sewage lift station. The sewage lift station will pump all waste water through underground piping to the property boundary where it will join the county sanitary sewer system. Waste water from the scale/guard house will enter the piping downstream of the lift station.

Waste and other nonhazardous liquids normally contained in refuse will settle along the sloped tipping floor to drains. Liquids in volume will not be accepted at the facility. In-line oil traps, separators, settling tanks and other necessary pretreatment equipment will be installed to meet Metropolitan Waste Control Commission (MWCC) requirements for wastewater discharge to the sewerage system. If MWCC tests show high strength characteristics or undesirable chemicals in the flow from the facility, the MWCC will require that the problems be resolved. The MWCC could prescribe corrective measures or add a surcharge to its regular service fee to recover costs it incurs.

PLANT SAFETY AND MANAGEMENT



PLANT SAFETY AND MANAGEMENT

Resource recovery plants require management of various recoverable and non-recoverable material. Proper transport, storage and disposal is necessary for good sanitation as well as safe handling of hazardous wastes. An important element of this management function is the control and prevention of fires and explosions. These risks have historically been a problem for RDF plants. General plant sanitation and vector control are other management concerns that directly affect the physical environment.

RECOVERABLE MATERIALS

The counties' contract with the facility operator requires recovery of both RDF and ferrous scrap. The operator also intends to recover aluminium and heavy combustibles such as chipped tires and logs. This section describes management of these materials, potential impacts and possible mitigation measures. Figure 10 indicates how the wastestream will be subdivided with resource recovery.

Recoverable Materials Management

Refuse-Derived Fuel

The RDF production process was described earlier in the EIS. After production, the RDF will be stored in a compactor until it is removed, via a covered trailer truck, from the site. The RDF will be removed daily from the compactor and transported to boilers for combustion. In some circumstances, the RDF may be stored on-site in a compactor or a trailer on a short-term basis. An average of 35 transfer trailer trucks will be used daily to transport the RDF.

Ferrous materials

Ferrous metals will be separated magnetically during waste processing, and conveyed to trailers for transport to market. The ferrous materials, like the RDF, will be removed daily. Approximately three transfer-trailer loads of ferrous materials will be generated during any one day.

Other materials

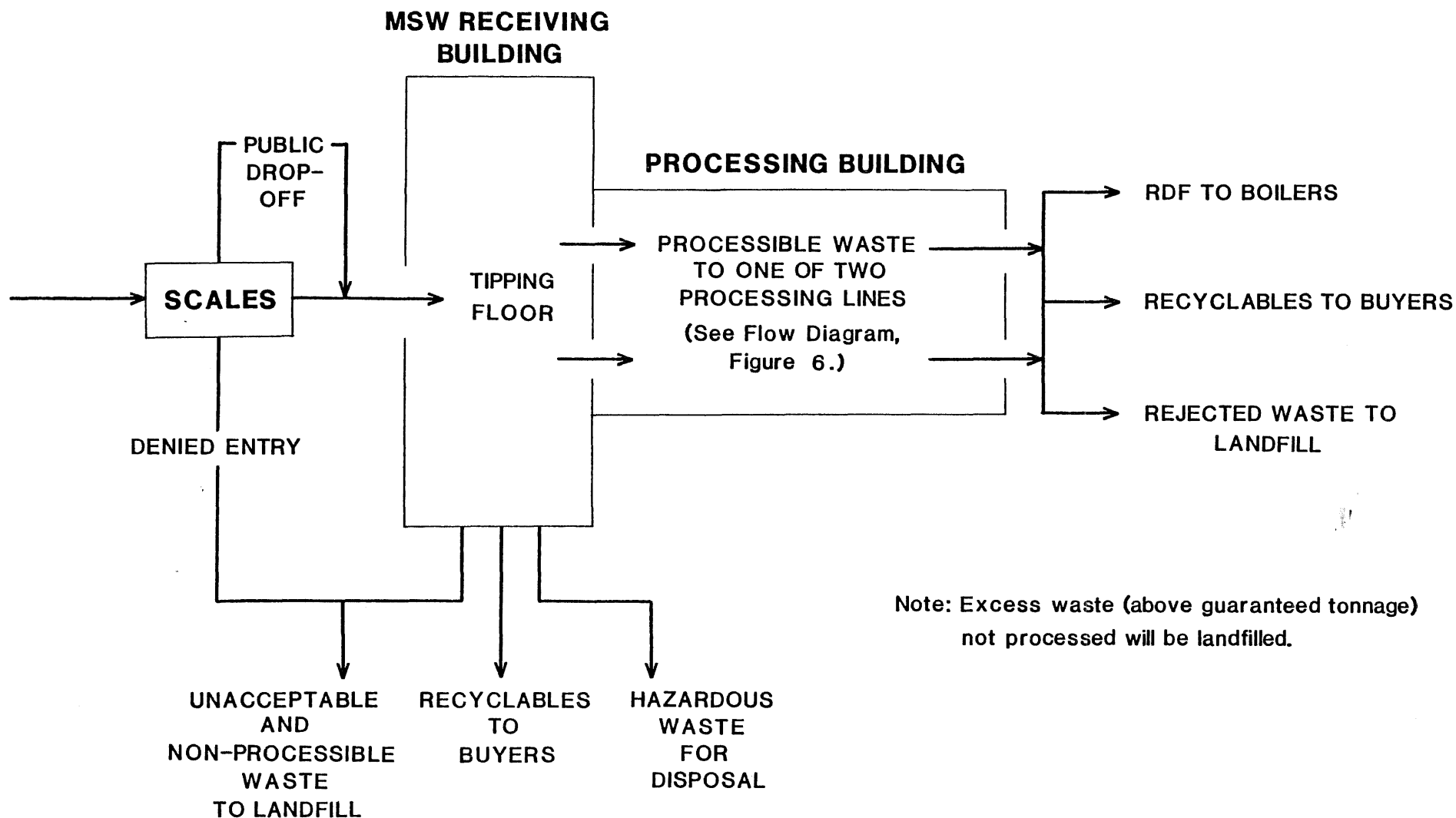
The facility operator intends to recover aluminum and may recover glass from the waste stream. Once separated, these materials will be handled similarly to the ferrous materials: they will be conveyed to covered trailer trucks, and ultimately, a market. Approximately three tons of aluminum and 120 tons of glass and sand may be recovered per day.

White goods such as stoves and washing machines will be separated from the rest of the waste when they are deposited on the tipping floor. They will be loaded on semi-trailers for transport to markets.

The operator also intends to use a portable shear shredder to process heavy combustibles such as tires and tree waste. No long-term storage of unshredded heavy combustibles will occur. After the materials are shredded, they will be combined with RDF on a conveyor line and transported in covered trucks to a combustion facility.

Interest has been expressed in composting the wet organic fraction of the facility's residue in the future. At this time, however, no specific proposal for a composting facility has been made.

Figure 10. WASTE FLOW AT PROPOSED RESOURCE RECOVERY FACILITY



Potential Impacts

Impacts from RDF handling should be minimal. The production plant has a control system which should minimize dust problems inside the plant (see Air Quality chapter). Furthermore, the RDF will be removed from the site in enclosed trailers, which will minimize the potential for dust or litter problems outside the plant. Under normal circumstances, RDF will be removed daily from the facility, however, up to three days of production could be stored at the site if necessary. The RDF should not substantially decompose during the three day period; odors generated by any decomposition of stored RDF should be negligible. Air reoderants will help neutralize what odors are generated (see Odors section in the Air Quality dhapter). A small increase in truck traffic will result from the transport of the RDF; the significance of this increase is discussed in the Sociological Impacts Chapter.

Impacts from ferrous, aluminum, glass, heavy combustibles and white goods handling are also expected to be minimal. No odor problems will occur. The material will be removed from the site on a daily basis in enclosed trailers, preventing litter problems. No long-term outside storage of materials will occur on a regular basis. When outdoor storage does occur, materials will be confined to enclosed containers.

Recovery of materials at the plant will help decrease the need for landfills and the potential for groundwater and other problems at landfills. Approximately 630 tons of RDF, 40 to 70 tons of ferrous and 3 tons of aluminum will be diverted from landfills daily. About 120 tons per day of glass and sand may also be diverted; in the event that these materials are landfilled as residuals rather than reused, their relatively inert character poses little threat of environmental problems at the landfill. Shredding tires and using them for fuel will avoid the health problems traditionally associated with tire stock-piles (such as mosquito breeding and fire hazards).

Mitigation Measures

The proposer's management plans appear adequate to control impacts. Key provisions of their plans include:

1. Enclosed on-site storage of materials;
2. Enclosed transport of materials; and
3. No long-term outdoor storage of materials.

These provisions should prevent or minimize the potential for a number of different impacts. For instance, long-term outdoor storage of tires could create a health hazard by creating mosquito breeding grounds. Aesthetic impacts could increase if large quantities of white goods are stored outdoors (although the industrial nature of the area limits the proximity of sensitive receptors). Dust and litter problems could result if the recovered materials are transported in uncovered trucks.

NON-RECOVERABLE MATERIALS

Although the facility will reclaim a substantial portion of the incoming mixed municipal waste stream, more than 30 percent is expected to remain as a non-recoverable fraction (Figure 3). This fraction will include materials that are unacceptable, non-processible, rejected in processing, and possibly compacted waste that exceeds processing and storage capacity.

The non-recoverable materials will require a management strategy that differs somewhat from that for recoverable materials. The following section describes and evaluates the management schemes for non-recoverable materials.

Proposed Management of Non-recoverable Materials

Unacceptable Wastes

Unacceptable wastes are those that are turned away at the entrance to the facility because they are likely to pose a threat to health or safety or because they may cause damage to or adversely affect the operation of the facility. They include but are not limited to: explosives, hospital pathological and biological waste, hazardous chemicals and radioactive materials, oil sludges, asbestos in identifiable quantities, cesspool or other human waste, human or animal remains, street sweepings, ash, mining waste, sludges, demolition debris, waste with excess moisture, and hazardous refuse of any kind (such as cleaning fluids, crank case oils, cutting oils, paints, acids, caustics, poisons, drugs or other material). This definition will automatically be expanded to include any chemicals or other substances determined in the future by a governmental agency to be harmful, toxic or dangerous.

Unacceptable waste is expected to comprise about five percent of the total waste stream. Packer trucks will be visually inspected at the scale house and loads containing identifiable unacceptable wastes will be denied entry to the plant. About 5% of the wastes brought to the facility entrance are expected to be unacceptable.

Non-processible Wastes

Non-processible wastes are those that enter the receiving building and are placed on the tipping floor, but which cannot be processed due to their physical characteristics or their potential harmful effects. They include but are not limited to: steel banding, baling wire, solvents, tree trunks or logs greater than six inches in diameter or five feet in length, other overweight or bulky waste, gasoline, kerosene, propane tanks in any size, aerosol cans in quantity, plastics in quantity, motor vehicles, automotive engines, transmissions, rear ends, springs, fenders or major parts of vehicles, trailers, agricultural equipment, marine vessels, or similar items, farm and other large machinery, liquids, nonburnable construction material, and waste other than paper products from service stations, auto paint shops, chemical plants, plastic processing plants and textile plants.

Some unacceptable wastes may escape detection at the scale house and be deposited on the tipping floor. Such wastes should be identified by front end loader operators as non-processible, and should be removed or segregated. About 5% of the wastes brought to the facility are anticipated to be non-processible.

A grapple operator situated at the junction of the receiving apron conveyors and the flail mill feed conveyor will also screen incoming materials. The operator will have the ability to selectively remove non-processible wastes.

Should inappropriate materials escape detection and enter the processing lines, mechanical problems with machinery or an explosion hazard could result. The facility design incorporates safety features that will help decrease the potential for serious hazards (see Plant Safety and Management Chapter).

Hazardous Wastes

Hazardous wastes are one type of unacceptable and non-processible waste. Ideally, hazardous wastes will not be delivered to the facility, but household quantities will undoubtedly arrive mixed with legitimate waste. NSP could require a hauler who dumps hazardous wastes on the tipping floor to reload and remove them. Hazardous wastes not removed by the hauler will be stored and disposed of by NSP in accord with state and federal laws and regulations.

Specific hazardous waste disposal procedures have not been proposed yet since the facility will not be operational for two years and the applicable regulatory controls may change. The following general guidelines will be followed:

- o Hazardous wastes with flammable, reactive or explosive properties must be separated prior to processing;
- o Collected hazardous waste must be stored in accordance with MPCA rules (such as the hazardous waste generator standards);
- o If more than 1000 Kg of hazardous waste is stored or if any quantity is stored for 90 days, a MPCA facility permit will be required; and
- o Collected hazardous waste must be disposed of or treated at licensed hazardous waste management facilities - either an NSP boiler for organically comprised wastes or an out-of-state treatment or disposal site.

Processing Rejects

Processing rejects include materials that are removed during the processing operation, but which are not recovered for reuse for technical or economic reasons. Expected components include grit, glass, stones, a wet compostable fraction and some non-ferrous metals. About 25 percent of the wastes accepted for processing will eventually be rejected.

The rejects can be described according to where they fall out in the waste separation process. Tramp metals (ferrous and non-ferrous) are the oversize materials from the primary (+4") disc screen that also comprise the heavy fraction remaining after air density separation. The tramp metals will be directed to a residue loadout area where they will be stored in a stationary compactor prior to their transport to a landfill.

Undersized materials from the primary disc screen will travel to a secondary disc screen (+2") which will help concentrate aluminum canstock. The aluminum canstock will be removed by hand. Undersized materials from the secondary disc screen that are not combustible will be directed to the residue loadout area where they will be stored for transport to a landfill or be available for reuse if such an option becomes feasible.

The reject material will be transferred to regulated landfills in 20-ton capacity trailers along with the non-processibles that do not have sufficient recyclable value. The trailers will be capable of unloading through the use of "live bottom" floors that eject loads to the rear. Waste that exceeds the processing and storage capacity of the plant will be compacted before it is loaded for delivery to a landfill.

Excess Waste

About 17% of the waste brought to the site may be rejected as excess waste that will not be processed. The amount actually rejected as excess will depend on what capacity the facility is operated at. Excess waste will be direct onto an apron conveyor, to compactors, and then to transfer trailers. The transfer trailers will transport the excess waste to a landfill for disposal. During emergency by-pass conditions, all waste brought to the facility may be directed to the transfer station area and directed to a landfill.

Potential Impacts

No significant adverse impacts are expected to occur at the project site as a result of the management of non-recoverable materials. No materials will be stored outside uncovered; rather, they will be stored in the receiving building, in stationary compactors located along the processing building or outside in totally enclosed containers. There will be an increase in traffic as materials are moved from the site; the significance of that increase is discussed in the Sociological Impacts Chapter. If hazardous wastes are not removed prior to processing, safety problems might result (see Fires and Explosives below). The identification, separation and storage of hazardous wastes may be dangerous activities in some circumstances.

Excess waste, processing rejects, unmarketed secondary materials and unused RDF will be landfilled. To the extent that the facility reduces the volume of waste going to landfills and removes undesirable materials such as hazardous wastes, it will produce a more stable residual product and decrease the probability of adverse impacts at landfills.

Mitigation Measures

Hazardous waste procedures for identification, handling, storage and disposal could be negotiated with the counties. Inventory and labelling requirements could be incorporated into these procedures. Particular attention can be given to proper employee training. Evaluation of equipment items that can be used to accurately and safely inspect, identify and handle suspicious wastes could be undertaken on a joint and periodic basis. Public and hauler awareness programs could be established in order to educate those using the facility about proper disposal of unacceptable and non-processible wastes, including hazardous wastes.

The facility could be operated at a capacity in excess of 1,000 tons per day in order to minimize rejected excess waste. Reducing the volume of excess waste would result in corresponding increases in the volumes of materials recovered and decreases in the volume of raw waste requiring landfilling.

FIRES AND EXPLOSIONS

According to the Resource Recovery Yearbook - 1984, 52 percent of existing resource recovery facilities have reported plant shutdowns for reasons other than routine maintenance. Shutdowns by facility type were as follows: 39 percent of modular units, 47 percent of mass burn, 64 percent of RDF and 100 percent of other facility types. A breakdown of explanations for the shutdowns included: equipment problems--22 percent, equipment retrofitting--14 percent, explosions--14 percent, environmental problems--10 percent, unfavorable economics--9 percent, fires--8 percent, and legal problems--5 percent.

Early design RDF facilities have had disproportionately poor shutdown records because of explosion and fire problems. Closed containers containing volatile gasses pose significant explosion risks when crushed or struck in RDF equipment. Inflammable chemicals that may be released in processing and ignite from sparks must be identified and controlled.

This history has led to a variety of new inspection, equipment, construction design and personnel training approaches. NSP's design consultant, National Ecology, experienced an explosion related shutdown of its Baltimore facility for three days in 1977 during its first year of operation. A new blast venting system and the initiation of routine monitoring of the explosion suppression mechanisms have helped avoid subsequent similar problems.

NSP will incorporate these and other preventive and control approaches beginning with inspection of refuse before processing. Refuse haulers will be advised of the types of waste that are acceptable for the facility and will exercise their judgment prior to delivery and inspection at the plant. Plant personnel will be responsible for wastes allowed on the tipping floor.

In contrast to early waste processing plant designs, a large tipping floor surface area will be used instead of a pit arrangement. This will allow improved visibility and the segregation of "probably safe" from "possibly unsafe" inputs. Unacceptable items such as gasoline and propane tanks will be removed to a licensed disposal facility. The large floor area will allow an opportunity for rough inspection by the front-end loader operators as the refuse is moved to the receiving apron conveyors from the storage floor.

Closer inspection will be achieved by the grapple operator as the MSW is tumbled and spread at the interface of the receiving apron conveyors and the flail mill feed conveyor. The operator will be housed in a cab constructed to withstand fire and detonation hazards with a provision for rapid exit and evacuation if required. The cab will be airconditioned, have a radio, and be connected by a hardwire communication system with the front-end loader operator and the control room.

Potentially hazardous areas will be monitored by closed circuit TV to avoid direct viewing by operators. Employees not shielded by special equipment will normally be exposed only to refuse streams that have already been inspected, shredded and screened and consequently are considered to be inert and safe.

The flail mill will be enclosed in a concrete blockhouse to contain an explosion or fire hazard. A blast vent will be installed on the roof and blast mats located over the vent to absorb projectiles. The access door to the blockhouse will be located in an off limits area so that no personnel or

equipment are in the blast path. No personnel will be permitted in the flail mill room during operation. In addition, the flail mills will be fitted with a water deluge system to extinguish any fire that may result from an explosion.

Combustible vapor detectors will be placed in the flail mill and shredder cells close to the floor level to reduce explosion risks and minimize damage when they occur. The detectors will activate an audible alarm in the control room at 50 percent of the lower explosive limit, and will activate a mechanical ventilating system (with manual override) to remove the combustible vapor. The minimum ventilating capacity is approximately three cfm/sq. ft. of floor area.

A Halon type explosion suppression system will be installed on each individual flail mill and shredder. This system sprays inert gas into the chamber to eliminate oxygen and avert a fire when abrupt pressure changes occur. The system will be designed so that an audible alarm will sound to indicate if the explosion suppression system is inoperative and the shredder is running.

All plant employees will be trained in the proper methods of fire and explosion prevention and suppression. Training will include thorough instruction in the design and operation of the safety equipment and the identification of hazardous and explosive materials in the waste stream. It will also address the communications with haulers and citizens who may wish to deposit waste.

The facility will have a fire protection system serving all the buildings and structures. Water for initial operation of the system will be supplied from a 4,500 gallon tank with sufficient capacity to operate a single hydrant or two or three hose stations for about 20 minutes. The local fire department is expected to connect a pumper truck to the plant's 150,000 gallon storage tank within this 20 minute period. The storage tank will be replenished by the plant well at the rate of 300 gallons per minute. A diagram of the fire protection system is shown in Figure 11.

The Newport Fire Department is located in the northwest section of the city within a half-mile of the site. It is served by 30 volunteers and houses two pumper trucks and a 1,500 gallon tanker truck. The city manager estimates a five minute maximum response time to the site. The department has an effective cooperative support agreement with the nearby communities including St. Paul and Woodbury.

A fire protection loop will be installed around the interior walls of the buildings. The loop will be warmed by a heating coil and insulated for freeze protection since the building heating system is not used during the production shift. The loop supplies fire protection water to the following systems:

(1) Building Hose Stations - Class III hose stations will protect all of the building areas and structures. The hose stations will include isolation valves, 100 feet of 1-1/2 inch hose, rack enclosure and adjustable fog-spray nozzles.

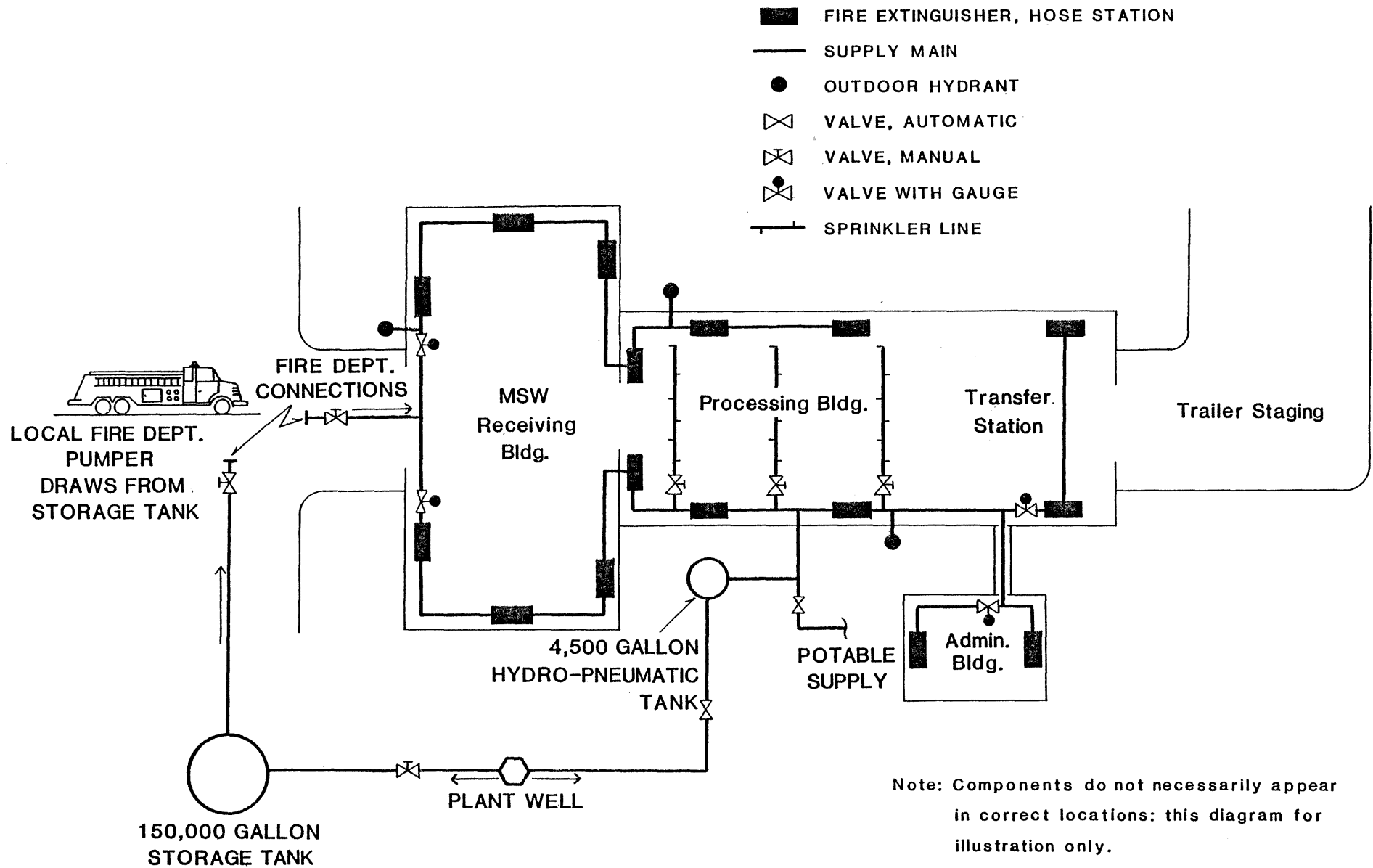
(2) Sprinkler Systems - Manually operated dry pipe sprinkler systems will protect the flail mills, secondary shredders, and their respective outfeed conveyor systems.

(3) Yard Hydrants - The yard area will contain three hydrants supplied by underground lines.

Potential Impacts

Explosion and fire risks appear to be controlled as effectively as state-of-the-

Figure 11. GENERALIZED FIRE PROTECTION SYSTEM DIAGRAM



art technology and management practices allow. Experience from the Baltimore Maryland facility operated by NSP's design consultant has led to important new design features. Disc screen separation devices instead of enclosed trommel cylinders will be used to avoid explosion damage. Flail mills have been selected instead of high speed shredders for the same reason. The other design features, equipment items, inspection procedures and training activities described have proven to be effective at the Baltimore facility over the past eight years.

Mitigation Measures

Careful testing of explosion and fire control systems could be conducted before the facility becomes operational and periodically thereafter. Since the switchover from the temporary to the main water tanks must be accomplished by the local fire department in an emergency, their arrival and hookup response time is of critical concern. Changes in the location or capabilities of the Newport Fire Department may directly affect plant safety.

Ongoing monitoring of information generated when the plant becomes operational and literature about other processing plants may provide new insights into state-of-the-art measures to control and prevent fires and explosions.

GENERAL SANITATION AND VECTOR CONTROL

General sanitation is important at waste disposal facilities to minimize debris, odor and vector problems. Odor and dust control are discussed at length in other sections of this report. Vectors are animals, birds or insects that may be attracted to the waste and transmit disease agents from the waste. Open dumps have caused significant vector problems in the past.

Vectors are normally attracted to waste because of the opportunity to forage for food. The most visible of these are birds, which can congregate in large numbers where waste deposits are left exposed. Rodents may gain access to the waste through improperly sealed storage containers at residences or businesses and be delivered to the facility by waste haulers. Rodents frequently forage when waste is left unattended. Flies can either be attracted to the waste or originate from it if eggs have been deposited in the waste prior to disposal.

The design of the waste processing facility eliminates most of the potential problem areas. Most of the waste is delivered to the tipping floor in an enclosed building. After delivery, the waste is subjected to almost constant movement. Vectors will have difficulty establishing homes and will generally be destroyed during processing or compacting operations. The maximum period for storage of incoming MSW and outgoing RDF or landfill material is three days. No materials will be stored outside except in enclosed trailers.

Baling of wastes has proven to be an effective vector deterrent at landfills. Compaction in the baling process reduces the exposed surface volume and either kills fly larvae and rodents or prevents them from emerging through the depth and density of the bales. The facility will accomplish the same effect through its processing, compaction and storage procedures.

The facility will be staffed with full-time maintenance people who will clean and sweep the tipping floor each night along with their other duties. The grounds outside the facility will also be cleaned on a daily basis by maintenance personnel. As an additional preventive measure, a pest control firm will be contracted to provide regular inspection and control. Bait laced with a chemical that induces internal bleeding and death will be used to dispose of rodents.

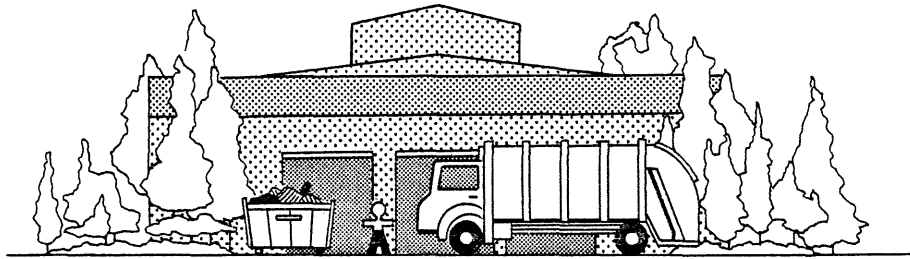
Potential Impacts

General sanitation and vector control plans for the facility appear to be thorough. The combination of containment within buildings and trailers, movement of the waste through the processing system, volume reduction from processing, compaction of materials, closed container storage, limited storage durations, general sanitation and pest control contractual service has worked successfully at the Baltimore facility over the past eight years. The citizen dropoff area will expose wastes to the elements. Citizens will drive up earthen ramps to drop their wastes into trailers. Spillage and exposed waste in the open-topped trailers may create problems.

Mitigation Measures

Shields to prevent debris from falling between and around the trailers in the citizen dropoff area could be designed and installed on these trailers. Alternatively, periodic cleaning of the area could be scheduled. Trailer covers can be put in place so that only the amount of space expected to be needed by citizens for relatively short intervals will be left exposed. It may be desirable for sanitation purposes to process the wastes from these trailers frequently even if they are only partially filled.

SOCIOLOGICAL IMPACTS



SOCIOLOGICAL IMPACTS

Sociological effects of a project should be identified in an EIS along with potential mitigation measures to help resolve concerns. The major sociological impacts of this project affect economics, transportation and visual impressions.

EMPLOYMENT/ECONOMIC

Construction

Project development is projected to occur over a two-year period. During this time the efforts of many people with diverse skills will be utilized. NSP's engineering consultant, Stone & Webster Engineering Corp., anticipates that nearly 1,000 people will have a role at some stage of construction. The average number employed at any given stage, however, will be much lower, approximately 38 employees with a peak level of 60 workers. Another six to 15 construction workers are expected to make improvements on Maxwell Rd. and extend central sewer service from the developed part of Newport to the site.

NSP projects that 90 percent of the construction work will be performed by Twin Cities based firms on a competitive bid basis. The proximity of labor and material will be advantageous in this competitive situation. Facility development expense is projected at \$20.7 million. The related roadway improvements and central sewer extension are projected to cost \$368,000.

There are several distinct phases to project development. Site preparation will encompass clearing, excavating, filling, grading and well drilling. Transportation improvements and a sewer extension from Newport can be completed as another phase concurrent with site preparation. Construction of the buildings and installation of equipment will be the major effort. Finish work on the grounds including entrance roads, parking and landscape installations will follow. An acceptance testing shakedown period is the final step before the facility becomes operational.

Operation

The facility will create at least 81 new permanent jobs as well as ancillary employment. Three operating shifts will require administrative, clerical, operations, and maintenance staff - approximately 36 full-time employees. Additional employment for about 25 people will result from contracts for haulers, pest control, snow removal, and general exterior and grounds maintenance. About 20 new employees will be retained at NSP's RDF boiler facilities at Red Wing and Mankato. An estimate of these staffing needs is shown in Table 6. Related spinoff employment may arise from industrial retail sales, commercial retail businesses catering to haulers and plant staff, and additional processing activity that may be initiated, such as co-composting and glass recovery. Materials reclamation businesses may choose to develop, expand or relocate in close proximity to the plant.

Impact On Property Values

Detailed study of the impact of waste processing facilities on nearby properties is not available. Generally, major industrial developments are viewed as community assets. The Ramsey/Washington project will improve roadway access for the surrounding area and extend a sewer line. At least one property is likely to become developable as a result of the sewer extension and the adja-

cent NSP substation will benefit from central sewer access. As indicated above, there may be several ancillary developments that materialize in response to business opportunities associated with facility operations. Success in achieving substantial spin-off growth may be equally likely to result from active promotional efforts by the city and others than from any inherent ability of the project to induce development.

ESTIMATED PERSONNEL REQUIREMENTS

<u>Plant Employees</u>	<u>Number</u>
Plant supervisor	1
Operational staff (2 shifts 7 am - 5:30 pm)	22
Office staff	5
Equipment maintenance staff (5 am - 1:30 pm)	<u>8</u>
Total	36
<u>Contract Haulers</u>	
RDF	15
Landfill	5
Recovered materials and hazardous waste	<u>1</u>
Total	21
<u>Electrical Generation Plant Employees</u>	20
<u>Ancillary Contracts</u>	
Pest control	Variable
Snow removal	Variable
Exterior and grounds maintenance	Variable

Source: NSP, Feb. 1985.

Development of the RDF facility will substantially increase the value of the project site. An increase of considerable magnitude in the tax payments on this property to local governments will occur because the facility is to be privately, instead of publicly, owned. Property tax revenues may increase as a result of ancillary business development as well.

Waste disposal facilities have a more sensitive image than do most other forms of development. This is particularly true for landfills and hazardous waste disposal facilities. One reference was found that specifically deals with the impact of waste incinerators on land values.* The findings were that such projects are normally located in industrial areas and hence, are compatible with adjacent uses. Effects were either positive or not discernable. The sole instance cited for a negative impact was attributed to poor facility operation rather than land use incompatibility.

*Terry Piersen, untitled study (received from the Waste Management Board), University of North Carolina, 1980.

Landfill property values and employment patterns are not likely to change if this project is completed. Waste that must be landfilled will continue to be generated, however, the capacity of existing landfills will last longer because of the abatement associated with this project. Despite the anticipated abatement, additional landfill capacity serving this area is projected to be needed by 1993 in the Council's draft Solid Waste Management Development Guide, based on regional waste generation estimates.

Cost Structure Burdens

The cost of waste disposal through a processing facility is higher than in existing landfills. To the extent that these higher costs are borne by waste generators based on their trash volumes, additional incentives for waste recycling and composting will arise. Illegal dumping could also result. Tipping fees that reflect the entire net cost of facility operations will encourage the marketplace to respond freely to trash volumes and recycling activities.

Higher disposal costs may allow some trash hauling firms to expand market share. Firms with substantial capital resources relative to operational size may maintain low prices and freeze out competitors. Operation at a loss to eliminate competition could occur regardless of tipping fee levels, but consumers may be more sensitive to costs when fees are rising. Standardization of the tipping fees, however, will prevent large haulers from gaining a competitive advantage by negotiating volume discounts.

Earnings from recovered materials other than ferrous metals are not reflected in the public service fee (tipping fee). This may give NSP more incentive to compete in recovered materials markets, but prevents waste generators from benefitting with offsetting reductions in disposal costs.

The waste disposal fee reflects a profit margin for NSP, processing volume, pass-through costs and fluctuations in coal prices that directly affect the practicality of RDF combustion by NSP. If other factors, like better markets for recovered materials, contribute to the profitability of this facility, NSP receives the revenue. If the net financial results of the project are incorporated into the NSP public utility rate base, electricity consumers will share with NSP stockholders the potential for improved profitability and the possibility of lower returns or losses. Exclusion from the rate base will require the project to be operated as an NSP subsidiary and stockholders will more directly assume the project risks and potential for financial return.

The project may contribute to cost avoidance by NSP. Combustion of RDF may reduce NSP's compliance costs for meeting future air quality restrictions. The low sulfur content of RDF may reduce the need for emission controls designed to avoid acid rain caused by sulfur.

Potential Impacts

The project is likely to increase employment and enhance property values and tax receipts. Negative impacts on landfills are not projected. Financial performance may be affected by whether the project is operated like other NSP facilities or as an independent subsidiary. If project financial results are not accepted in the NSP rate base, the project will have to operate as a subsidiary. Subsidiary status may involve higher costs and more employees or contract personnel for management, accounting, training, planning, public relations and other support services that are currently structured as corporate support services.

Mitigation Measures

The public service formula used to set the waste disposal fee at the facility could be renegotiated to offset a portion of earnings from recovered materials. This would allow waste generators to benefit along with NSP if recycling markets become stronger in the future. Project financial results could be included in the NSP utility rate base to allow NSP's corporate support services to be relied upon consistent with the project's design and NSP's established pattern for operating electrical generation plants.

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TRANSPORTATION

This section discusses traffic congestion and related problems that may be associated with the project. It relies almost entirely upon a transportation study conducted by Environmental Resources and Technology, Inc. (ERT) under contract with the Metropolitan Council. The document containing the analysis was incorporated by reference in the EIS Executive Summary.

ERT staff conducted both mechanical traffic recorder and manual turning movement counts during January and February, 1985. This information was used with traffic volume and future traffic growth projections provided by the Minnesota Department of Transportation (MDOT). Peak hour traffic volumes were compared with accepted design capacity standards for the roads that would be most affected by the facility.

Peak hour measurements corresponded to the AM and PM periods when most commuters are travelling to and from work; 7:00 to 8:00 AM and 4:00 to 5:00 PM. The capacity standards measure the quality of traffic flow or Level Of Service (LOS) based on physical conditions, vehicular volume and, for intersections, the prevailing traffic control. The LOS indicators range from "A" with stable free flow to "E" where traffic volumes are at capacity and result in unstable flow. LOS "F" is a condition of considerable congestion and frequent delay. LOS "C" is generally considered the acceptable operating standard.*

1985 Baseline

All of the key intersections and on/off ramp areas through which facility generated traffic is expected to pass are currently performing at or better than the LOS "C" stable flow condition (the accepted operating standard). The actual LOS figures are presented in Table 7. Traffic flow impacts on the interchanges connecting I-494 and U.S. Hwy. 61 are projected to be too small to register level of service differences. Figure 12 portrays the site vicinity roadway network.

* Highway Research Board Special Report 87, Highway Capacity Manual , 1965.

* Transportation Research Board, Circular Number 212, Interim Materials on Highway Capacity , Hanuary 1980.

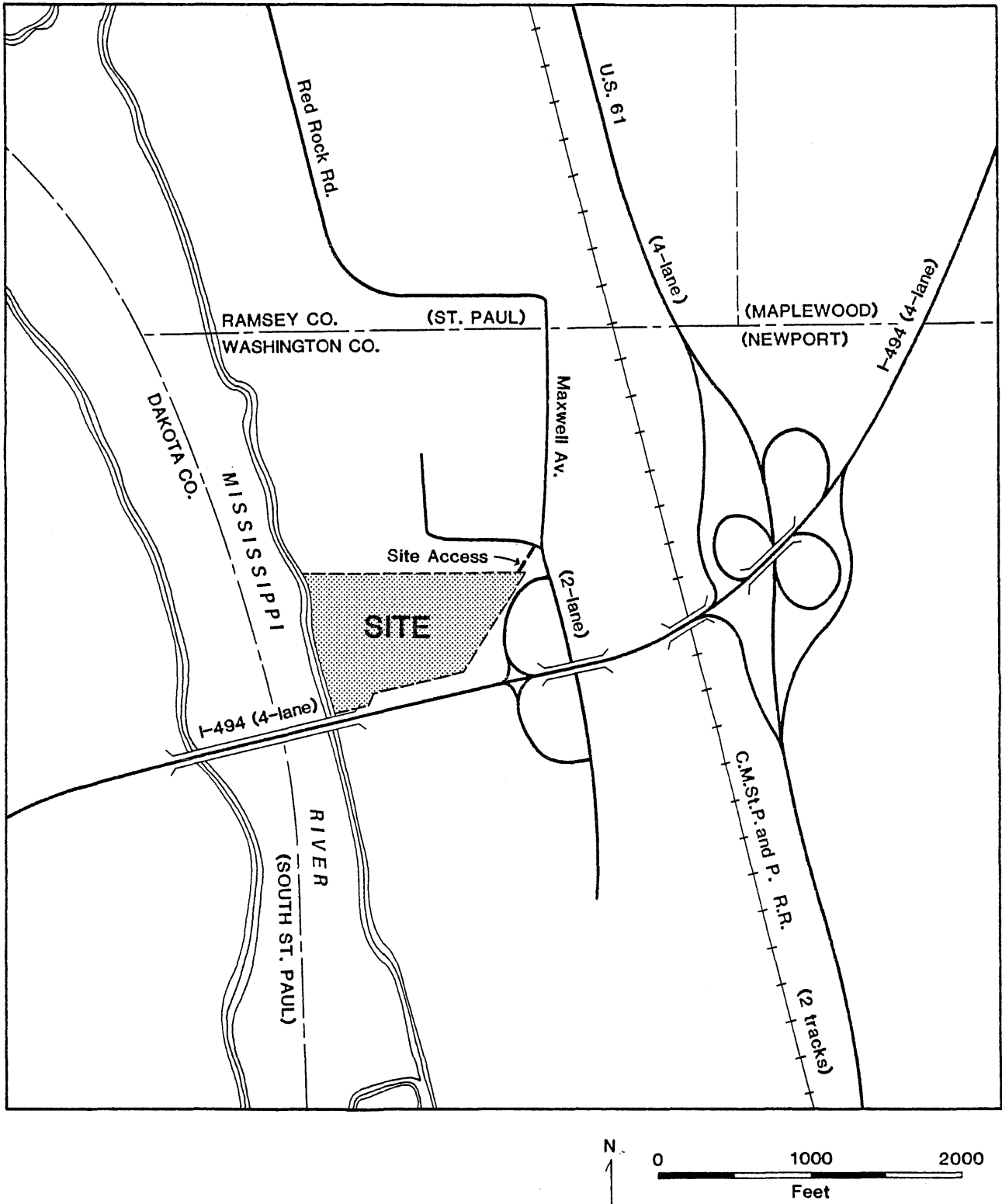
Figure 12. VICINITY ROADWAY NETWORK

TABLE 7
CRITICAL INTERSECTION OPERATING CONDITIONS
1985 EXISTING LEVEL OF SERVICE

Intersection/Ramp	Level of Service	
	AM	PM
I-494 westbound on/off ramp at Maxwell Rd.	B	A/B
I-494 eastbound on/off ramp at Maxwell Rd.	B	B
I-494 westbound on/off ramp	C	B
I-494 eastbound on/off ramp	B	C

Source: ERT, 1985

Traffic Conditions During Peak Construction

Construction truck traffic is expected to average between 40 and 50 vehicles per day. Assuming that the 50 trucks will arrive during the course of a 10-hour workday on a random basis, it is estimated that 5 delivery trucks will arrive and depart the site during both the AM and PM peak hour periods.

It is estimated that 60 construction employees will be arriving and departing the site on a daily basis during the three to six month peak construction period. Of the 60 employees, 25 percent are expected to arrive during the AM commuter peak hour and depart during the PM commuter peak hour. Assuming a vehicle occupancy rate of 1.0 person per vehicle, 15 vehicles are likely to arrive during the AM peak hour and leave during the PM peak hour.

Expected arrival and departure routes for the employee and truck construction traffic are estimated to be as follows:

- 50 percent by U.S. 61 from the north
- 25 percent by I-494 from the west
- 20 percent by I-494 from the east
- 5 percent by U.S. 61 from the south

The data show that the only change in level of service as compared to baseline 1985 operations without construction of the project will occur at the I-494 eastbound on/off ramp in the PM peak hour. With the peak construction traffic volumes, level of service on the eastbound ramp will fall from LOS "B" to LOS "C".

1988 Baseline

In preparing an analysis of future year traffic conditions, historic traffic data should be analyzed to identify any apparent patterns of growth. Growth patterns can then be used to adjust existing 1985 traffic volumes to future baseline traffic conditions. Using data obtained from MDOT, past traffic volumes were analyzed for I-494 and U.S. 61. A growth figure of 2.5 percent

per year was arrived at through review of historic data. This growth causes only one difference from the 1985 baseline condition - the I-494 eastbound ramp at Maxwell Rd. is projected to operate between the LOS "B" and "C" levels during the PM peak hour.

Project Operations Traffic Flow

In calculating the number of vehicles associated with operation of the RDF facility, three different sources of traffic were identified. They are:

- (1) Refuse delivery trucks,
- (2) Output transfer trucks, and
- (3) Employee vehicles.

Operations Refuse Trucks

Refuse truck activity generated by the RDF facility during the AM and PM peak hours was calculated based on the quantity of refuse to be processed by the facility. This estimate was compared to similar facilities. The daily number of refuse trucks utilizing the facility is estimated at 225 vehicles. The estimated 225 refuse vehicles is based on the conservative estimate that 1,350 tons of solid waste will be delivered to the facility six days each week, and that the waste will be hauled to the facility in six-ton trucks.

Peak refuse truck traffic is not expected to coincide with the existing AM and PM commuter peak hours. However, in order to represent worst case assumptions a comparison of two resource recovery facilities was made. One facility is an existing RDF facility in Maryland and the other a proposed mass-burn facility in Massachusetts. Based on truck arrival data from these two sources, in the worst case it is estimated that ten percent of the total refuse trucks will arrive and depart the site during the AM peak hour, and six percent will arrive and depart during the PM peak hour.

Directional distribution of the refuse truck traffic is estimated as follows:

- 50 percent by U.S. 61 from the north
- 25 percent by I-494 from the west
- 20 percent by I-494 from the east
- 5 percent by U.S. 61 from the south

Transfer Trucks

The number of transfer trucks estimated to enter and leave the facility is about 70 twenty-ton vehicles daily. Based on information for an existing RDF facility in Baltimore, Maryland, the daily distribution of transfer trucks is expected to be relatively even throughout an eight to ten hour operating period. Therefore, it is estimated that ten transfer trucks per hour will be entering and leaving the facility during both the AM and PM commuter peak hours.

Directional distribution for the transfer truck traffic is different from that for refuse trucks since most of the transfer trucks will be bound for the boilers where the waste will be burned. The full RDF transfer vehicles will be bound for boilers located at two NSP facilities. An 80/20 split was projected in RDF deliveries to the Red Wing and Mankato boilers, respectively. About 20 transfer loads of excess waste and residuals from processing are projected to use westbound I-494 for landfill deliveries. The three or four loads of recovered materials each day may vary in destination.

Operations Employee Traffic

The daily primary operating shift for employees is expected to be from 7:00 AM to 5:00 PM. During the day shift about 20 operators and five office employees will arrive and depart. During the late night shift, 5:00 PM to 1:30 AM, about ten maintenance workers will be on duty. For purposes of analysis, a conservative estimate of 25 employee vehicles is expected to arrive during the AM peak hour and leave during the PM peak hour when ten vehicles carrying late shift employees will arrive. Directional distribution for employees was assumed to be the same as that for facility refuse trucks.

The proposed facility is expected to be fully operational in 1988. To determine the efficiency of the roadway network in the vicinity, the additional traffic from the facility - refuse vehicles, transfer trucks, and employees - was added to the 1988 baseline volumes. All the intersections and ramps analyzed are expected to operate at a LOS "C" condition or better. Table 8 displays the level of service estimates for the various intersections and ramps under the operational condition.

TABLE 8
TRAFFIC LEVEL OF SERVICE VALUES WITH FACILITY OPERATION (1988)

Intersection/Ramp	Level of Service	
	AM	PM
I-494 westbound on/off ramp at Maxwell Rd.	C	A/B
I-494 eastbound on/off ramp at Maxwell Rd.	B	B/C
I-494 westbound on/off ramp	C	B
I-494 eastbound on/off ramp	B	C
Site access road at Maxwell Rd.	A/B	A/B

Source: ERT, 1985

The table shows that with an operational resource recovery facility, LOS conditions will fall below baseline 1988 conditions at one intersection - the I-494 westbound ramp at Maxwell Rd. Level of service will be decline from LOS "B" to LOS "C" conditions. Operating conditions of the other intersections will remain unchanged. In all instances, intersections in the area will operate at LOS "C" or better conditions.

Transportation Safety Analysis

Safe operation of roadways and intersections requires that several conditions be satisfied. Adequate sight distance must exist on all roads to provide time for approaching vehicles to decide to proceed with a merging or diverging

maneuver. Safe operation requires the existence of sufficient gaps in vehicle traffic on roadways so that vehicles entering the traffic flow can do so safely. Also, an intersection should be controlled in the proper fashion, either signalized or unsignalized in order to ensure safe operations.

Desirable stopping sight distances at the facility entrance and the I-494/Maxwell Rd. intersections are 300 and 400 feet, respectively, given the posted speed limits and the standards in the Transportation and Traffic Engineering Handbook. The existing sight distances of over 1000 feet are well in excess of the standards.

The Manual on Uniform Traffic Control Devices, published by the U.S. Dept. of Transportation, describes traffic signalization warrants. Signals are only warranted when for each of any eight hours of an average day the traffic volumes on both the major and minor intersecting streets reach specified levels. The current and future traffic volumes on Maxwell Rd., near the facility site, do not warrant the implementation of a traffic signal at any of the key intersections.

Field observations indicated that existing truck traffic had some difficulty operating on the roadway network in certain instances. Study of technical layouts of the I-494 ramp intersections with Maxwell Rd. revealed that adequate turning radii do not exist for large 18 wheel semitrailer combinations. Future improvements to increase the turning radii at the two intersection locations may be needed if it is found that adequate turning radii do not exist for transfer vehicles.

Merge and diverge characteristics of the I-494 ramps were analyzed and no ramp deficiencies were noted. Three lanes of travel in each direction on I-494 adequately allow for merging and diverging. The roadway and ramps connecting I-494 with U.S. 61 were also found to be adequate with respect to merge and diverge maneuvers.

Construction of the proposed resource recovery facility will require an efficient and adequate access road. The access road as designed will have adequate turning radii to accommodate the largest trucks the facility will serve. It will also provide adequate storage capacity for trucks accessing the site as well as adequate volume capacity.

The field survey noted that adequate "gap time" exists for traffic leaving the site to enter the traffic flow on Maxwell Rd. More than the 10 second standard for major roads identified in Transportation Circular Number 212 (National Academy of Sciences, 1980) is generally available.

Traffic Accidents

Traffic information from MDOT reveals that the number of accidents in the project area has remained relatively constant from 1981 through 1983 despite increased traffic volumes. The interchange between I-494 and U.S. 61 suffered the highest accident rate - 16 mishaps in 1982. There were no accidents on Maxwell Rd. between I-494 and the Burlington-Northern railroad crossing. The data show that there were no fatalities in the project vicinity during the three-year period.

Potential Impacts

Traffic movement during peak use periods will be somewhat affected by the volume of traffic associated with the facility. Speeds may be restricted by traffic volumes, but flow should be stable and allow for maximum passage of vehicles. No key roadways near the facility are projected to operate at a level of service below the desired standard for urban intersections. With a total of approximately 330 vehicles likely to regularly enter and leave the facility each day, typical traffic movement patterns should not be significantly affected by plant operation. Turning radii from Maxwell Rd. to the I-494 ramps may prove to be inadequate for large semitrailer combinations and road improvements may be desired in the future.

City officials have expressed concern that truck traffic will use southbound U.S. 61 to 20th St. in downtown Newport and take city streets back to Maxwell Rd. and the facility. This represents an extra distance of 1.5 miles for such traffic. If this pattern develops, it may offer advantages to local businesses that presumably would attract the traffic.

Mitigation Measures

Although traffic congestion is not projected, the impacts that will occur could be mitigated in a number of ways. Rail or barge transport could be used to deliver outgoing RDF and possibly incoming MSW from the St. Paul area as well. Use of barges, however, may not be feasible due to seasonal limitations. Co-composting of RDF with sewage sludge at the Pig's Eye Treatment Plant could depend on Maxwell Rd. to link the facilities and reduce impacts on the freeway interchanges. Employee schedules could be adjusted to avoid arrival or departure during peak traffic periods.

Other mitigation measures could include signing, site access modifications, and site access restrictions during peak traffic hours. Turning and by-pass lanes as well as a new road surface that will be installed by Washington County are discussed in the "Provision of Urban Services" chapter. It may also be desirable to increase the turning radii on the ramps connecting Maxwell Rd. and I-494 to accommodate large semitrailer transport vehicles.

If traffic on local city streets proves to be burdensome, weight and noise restrictions could be applied and enforced. Washington County could assume ownership of Maxwell Rd. near the facility entrance from Newport. This might simplify maintenance responsibilities since the county owns and maintains a section of Maxwell Rd. on the south side of I-494.

VISUAL

The proposed Ramsey/Washington RDF facility site is situated in a low-lying area along an industrialized section of the Mississippi River. The site is in Newport's Critical Area Urban Diversified District and is zoned General Industrial. Over 50 percent of the area north of I-494 and U.S. Hwy. 61 and the river in Newport is currently vacant land with the potential for future industrial construction. Site construction conforms to the existing surrounding land uses, examples of which are the Northern States Power Company Red Rock Substation and maintenance facility immediately to the north, and the heavy-industry buildings along the Pig's Eye Lake channel. Due to the low profile of the project (maximum height of 55 feet), the nature of the surrounding land use and the topography of the area, any negative visual impacts will be minimal and should not effect any large residential areas.

Figure 13 illustrates the area from which the project's buildings may be seen. Only areas within one mile of the site were considered; beyond this limit, the site is virtually impossible to see due to terrain and distance.

The topography to the east of the site, the built-up area of Newport to the south, and the industrial land uses immediately across the river result in a highly irregularly-shaped viewing area. Existing vegetation was not taken into account in the analysis and could greatly diminish the area of complete or partial visibility, particularly from the heavily wooded bluffs to the north and east of the site.

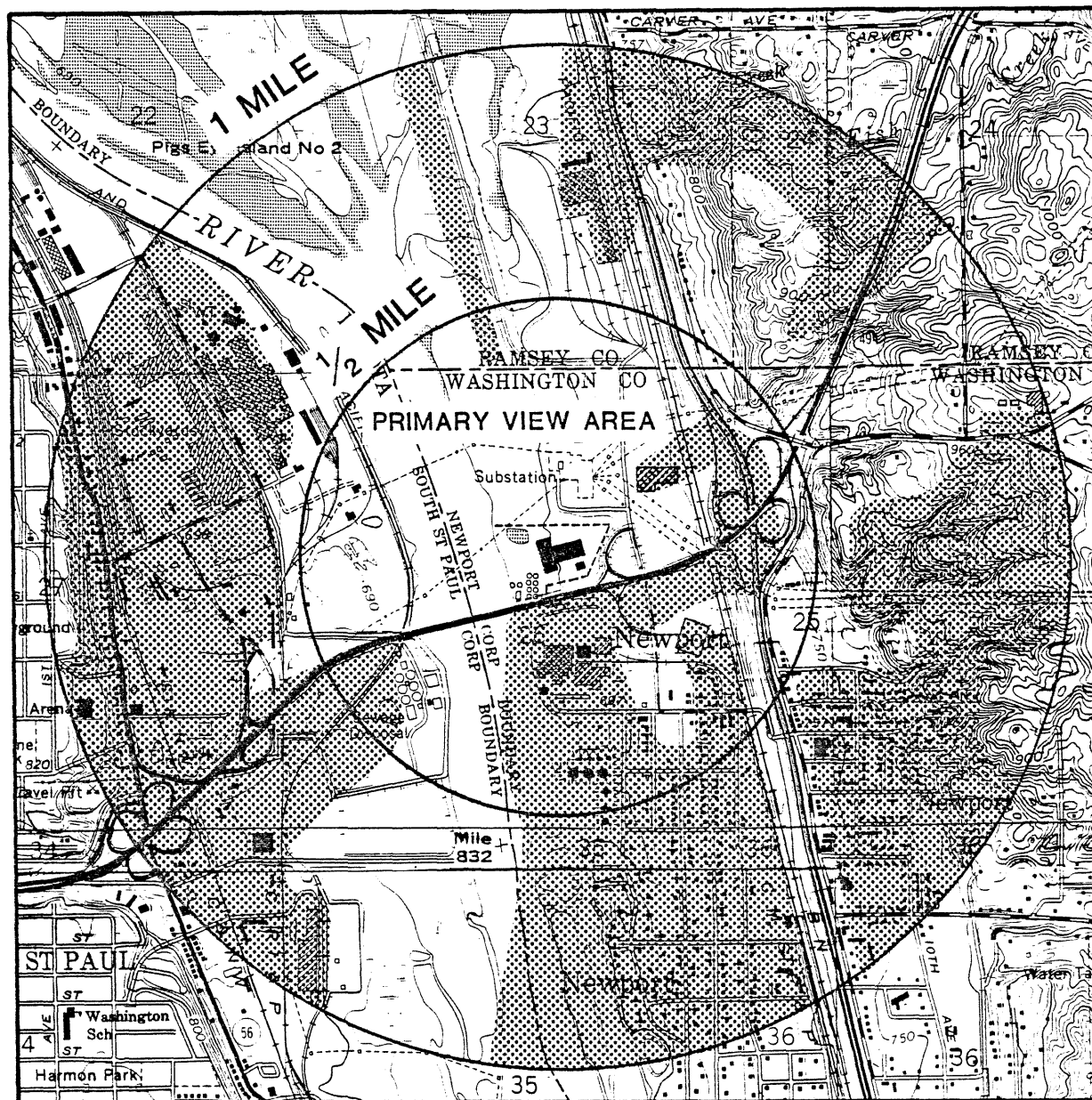
Potential Impacts

The primary view area as shown on Figure 13 (generally north of the interstate and within one-half mile of the site) includes a section of Hwy. 61, the interstate, the industrial/vacant lands to the north and west, and one or two residences along the base of the bluff north of the I-494/U.S. Hwy. 61 interchange. It is from this general area that a full view of the project's buildings may be afforded. Areas outside of this limit should only get a partial view, if any. The peak height of the proposed processing building will be approximately 15 feet higher than the elevated portion of I-494 immediately to the south. As a result, the upper portion of the building may be visible to a small area of the Newport residential district along 21st Street and the commercial district along Hwy. 61 south of the interstate, due to a lack of intervening obstacles. The distance of one-half mile or more, however, renders any potential negative visual impact negligible.

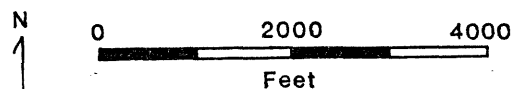
Two residential areas which may receive a full view of the site are both outside of the primary view area. They are the ten or so residences at the base of the bluff along Hwy. 61 between the I-494 interchange and North Star Steel, and the houses along First Avenue South at the edge of the bluff across the river in South St. Paul. The distances involved (from one-half mile to over one mile) will substantially diminish the visual impact of an already expansive industrialized landscape.

One small parcel of public open space lies within one mile of the site (Figure 2), however, the view of the site is completely obstructed by intervening buildings and vegetation.

Figure 13. VISIBILITY OF NEWPORT RDF FACILITY



Base Map Source: U.S.G.S.



Shading represents those areas whose view of the facility should be totally obscured by topography, intervening buildings or elevated roadways. Existing vegetation not taken into consideration.

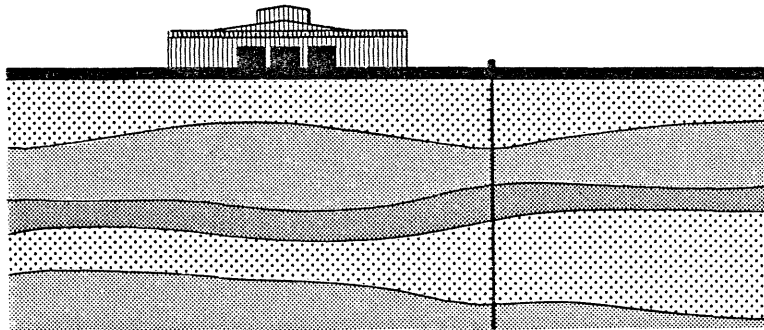
The site can be seen, in whole or in part, from a stretch of the Mississippi River just south of the I-494 bridge north to the barge fleeting area off Pig's Eye Island No. 2. The existing deciduous vegetation on the levee should obscure the view of human and traffic activity and the lower portions of the receiving building as proposed by NSP in Figure 5. The abandoned on-site tank farm (treatment plant) is also visible from the river. The city of Newport suggests dismantling the tanks and buildings.

Mitigation Measures

NSP proposes the retention of much of the existing on-site vegetation, plus additional deciduous/coniferous screening around the building and traffic areas. Due to the profile and placement of the buildings, this should provide effective screening. It would be impossible to screen the view of the buildings from all areas, and the nature of the surrounding land use precludes the necessity to do so.

The project proposer could consider dismantling the tank farm, creating an additional ponding area for surface water runoff, allowing the existing vegetation to naturally encroach upon the area, and planting additional vegetative screening.

SOILS AND GEOLOGY



SOILS AND GEOLOGY

EXISTING CONDITIONS

Soils

The proposed site is located adjacent to the Mississippi River, and soils on the site are primarily alluvial. They include the Faxon silt loam and the Chaska silt loam (Figure 14). The soils are nearly level and are poorly drained. Some Udorthents (heterogenous fill material) with wet substratums are also present on the site.

The characteristics of the on-site soils present some development problems. The soils have high seasonal water tables and a shallow depth to bedrock. They are highly susceptible to frost heaving and have a high corrosion potential for uncoated steel, but a low corrosion potential for concrete. Because these soil types necessitate special engineering, they are not recommended as conventional building sites.

Geology

The Prairie-duChien bedrock group lies at shallow depths beneath the site. The group consists of dolomite, sandy dolomite, and some interbedded quartzose sandstone, and is approximately 150 deep in the site vicinity. At the proposed site, the dolomite lies at depths ranging from a few inches to three or four feet from the surface. If the proposed facility included excavations into the bedrock, dewatering wells would be needed because the water table is near the land surface.

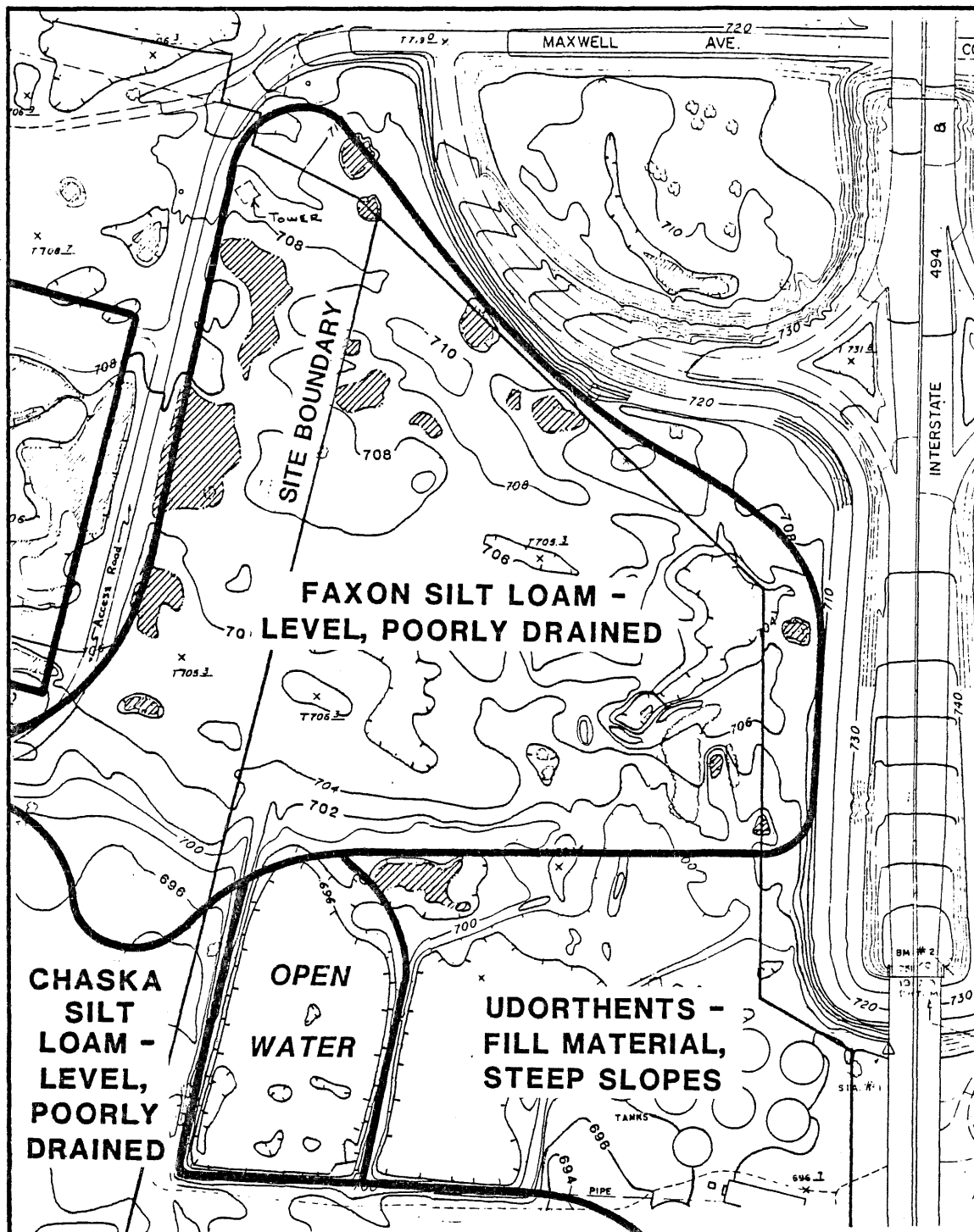
POTENTIAL IMPACTS

If the project proposers were to build on the existing soils, the facility would have an inadequate foundation and would likely have problems with frost heaving, seasonal flooding and high water tables. Higher quality soils will be imported and used as fill, however, and are expected to provide a more suitable foundation material. The fill will also elevate the facility above the 100-year flood level, but will not substantially increase flood heights. At this time, the specific engineering qualities and sources of the soils have not been identified.

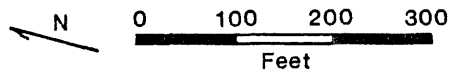
This proposal, like any other construction project, will temporarily raise the site's soil erosion rate. Erosion rates are expected to be elevated until vegetative cover can be re-established after construction.

No adverse impacts on groundwater or geologic resources are expected. No waste materials will be stored outside the facility, and no waste materials will be placed below the groundwater table inside the facility. A 4,000 gallon diesel fuel storage tank will be buried on the site. The tank will provide fuel for front-end loaders and other equipment. Because of the site's high water table, special measures may be needed to anchor the tank and to prevent tank corrosion. If the tank were to develop a leak, localized contamination of groundwater and contamination of the river could occur.

Figure 14 . ON-SITE SOILS



Source: Soil Survey of Ramsey and
Washington Counties, U.S.D.A.



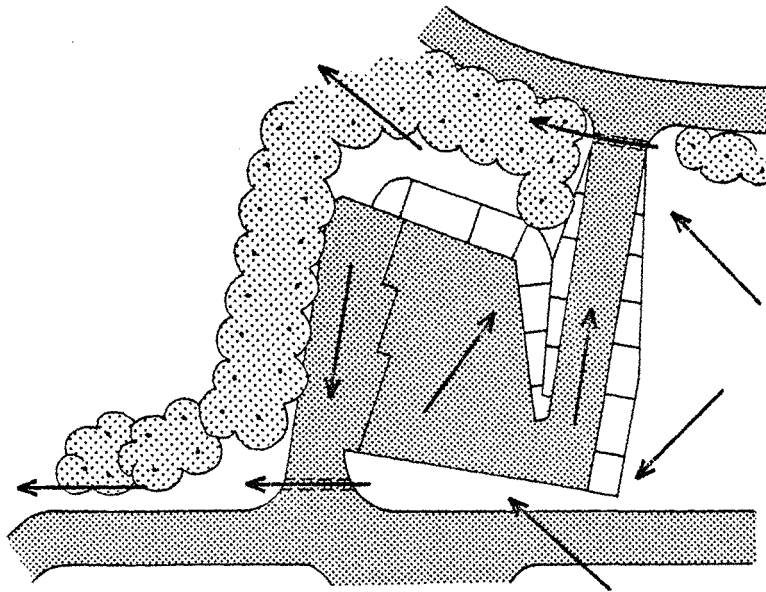
MITIGATION MEASURES

The primary mitigation measure proposed to overcome the inherent problems of building on the site's soils is to import fill to provide a suitable foundation material and to elevate the facility above the 100-year flood level. Care should be taken during fill placement and facility construction to minimize soil erosion. Measures that could be undertaken include, but are not limited to:

- o Staged development of the site;
- o Prompt revegetation of disturbed areas; and
- o Mulching of unvegetated areas.

Measures could also be taken to insure the integrity of the buried diesel fuel tank. For instance, a fiberglass tank could be installed to minimize the potential for problems with corrosion and, subsequently, leaks. The tank could be ballasted to keep it in place during periods of high water. It could also be designed to be filled and sealed to prevent tank movement and minimize the potential for groundwater contamination during high water periods.

SURFACE WATER



SURFACE WATER

EXISTING CONDITIONS

Site Description

The proposed site is located adjacent to the Mississippi River. It is within the river's designated Critical Area and its 100-year and 500-year floodplains (Figures 15 and 16). Surface water runoff from the site flows through three small subwatersheds to eventually enter the Mississippi River.

A number of small wetlands, as well as a larger detention pond, exist on the site. These areas provide about five acre-feet of water storage capacity. During the 100-year precipitation event, the site generates about 8.0 acre-feet of runoff. (Table 9).

Table 9
RUNOFF VOLUMES BEFORE AND AFTER DEVELOPMENT*

	<u>Runoff</u> (acre-feet)
Before	8.0
After	8.6-9.2

Sources: USDA Soil Conservation Service. Hydrology Guide for Minnesota; Soil Conservation Service. Urban Hydrology for Small Watersheds.

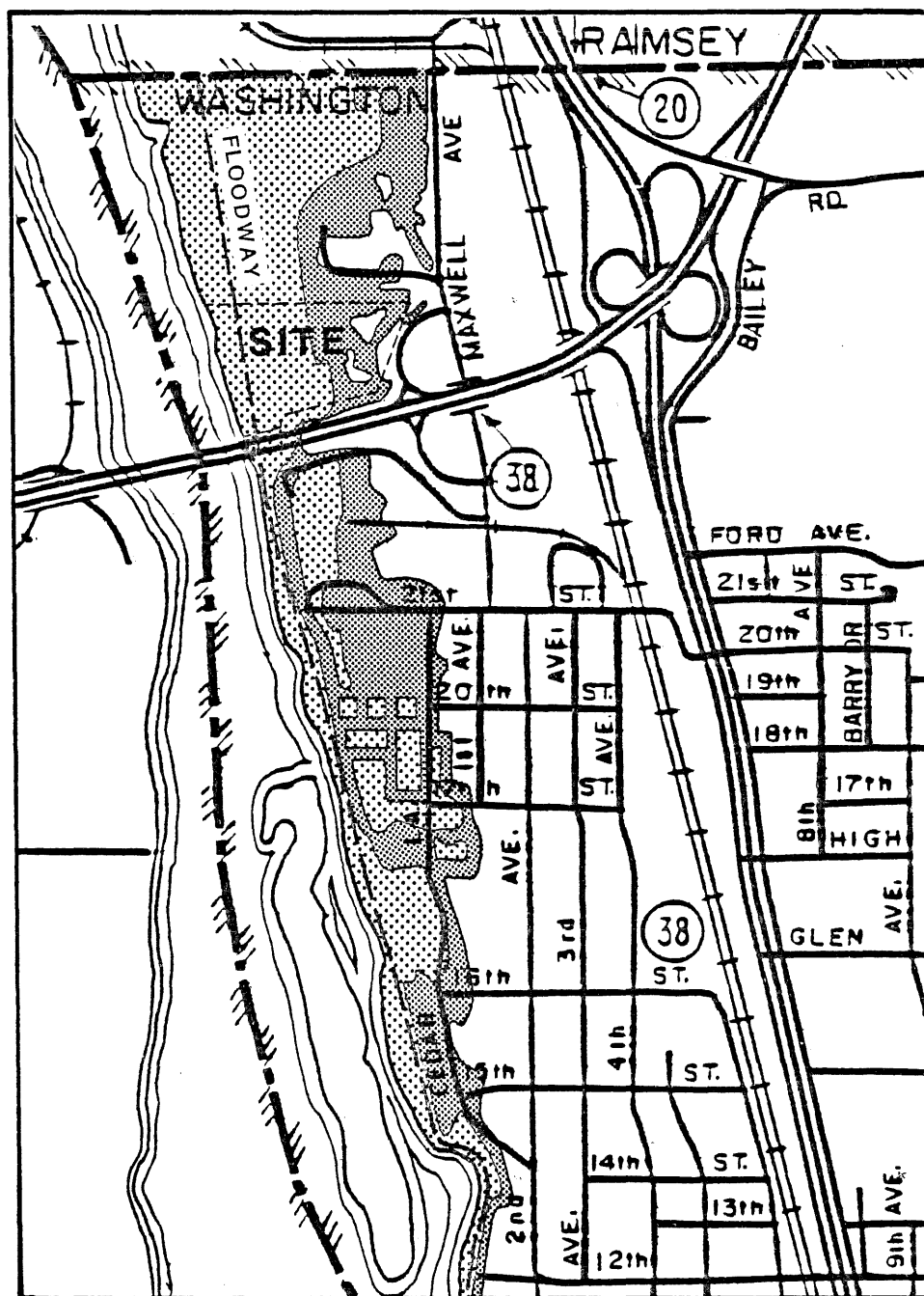
*Based on the 100-year, 24-hour storm (6 inches of precipitation in 24 hours). A range of values are given for runoff because the characteristics of soils to be used for fill are unknown. The low numbers indicate soils with moderate infiltration rates; the high, soils with very slow infiltration rates.

Development Controls

The city's Critical Area Plan (CAP), Critical Area Ordinance and Flood Plain Ordinance are all intended to ensure appropriate development of the river corridor, and attempt to protect natural resources as well as to minimize the probability of increased flood elevations and flood damage to property. The proposed site is identified in the CAP as a part of an Urban Diversified District (Figure 16). According to the plan, this district is intended to be "used and developed to maintain the present diversity of industrial, residential and public uses on the lands; conserve natural, scenic and environmental resources; maintain the existing transportation role of the river; and protect and expand enjoyment of the scenic values of the District."

Although industrial development is allowed in the Urban Diversified District, it must conform with the provisions of the Critical Area Overlay District Ordinance and the Flood Plain Overlay District Ordinance. These ordinances impose controls in addition to those found in the regular zoning ordinance.

Figure 15 .
EXTENT OF FLOODPLAIN



Base Map Source: Minnesota Dept.

of Transportation

Data Source: Newport Comprehensive Plan

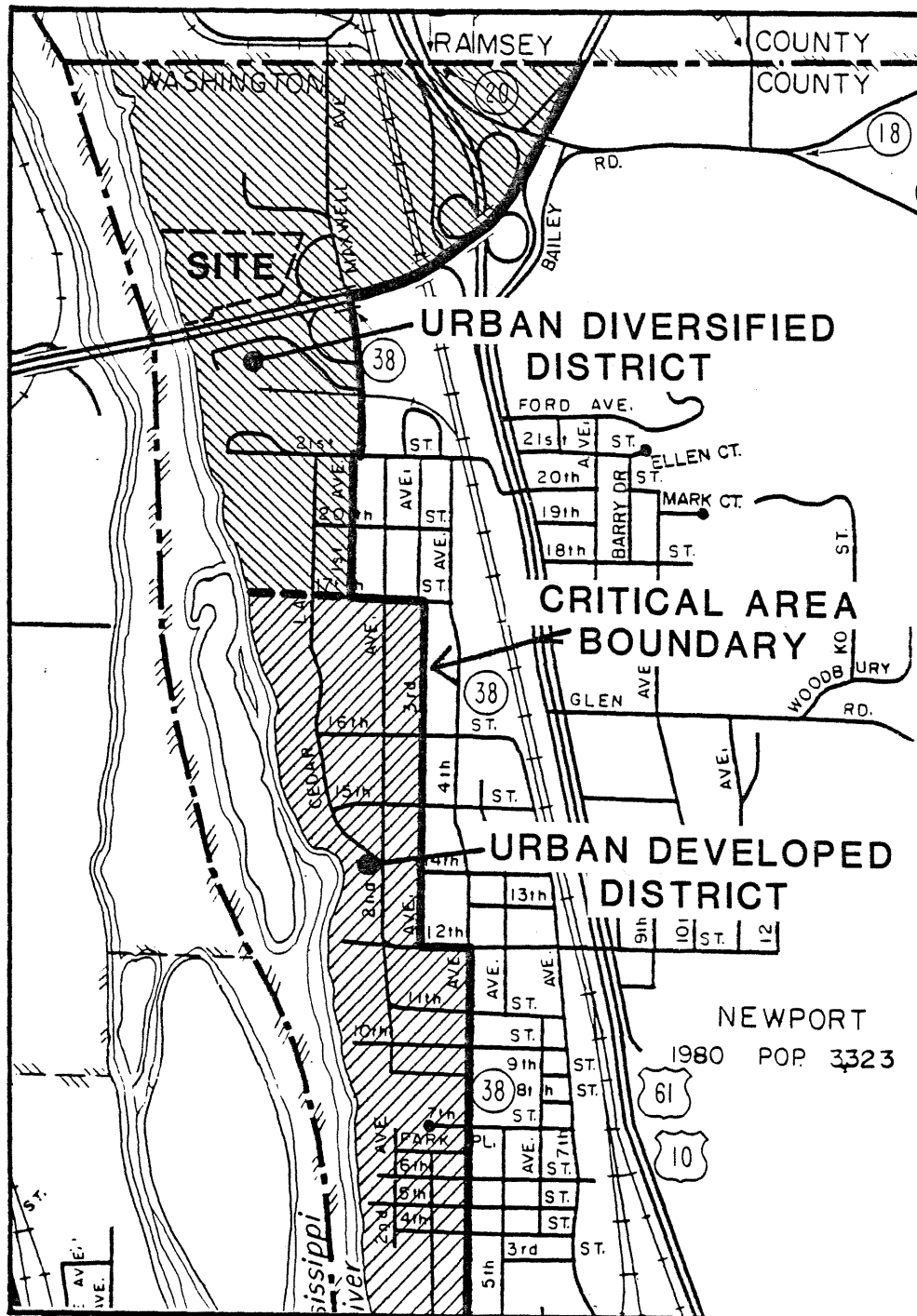


0 1000 2000
Feet

-  Zone A: 100-year flood
-  Zone B: 500-year flood
-  Zone C: Greater than 500-year flood

Note: Data for city of Newport only

**Figure 16 . LAND USE DISTRICTS WITHIN
THE NEWPORT CRITICAL AREA**



Base Map Source: Minnesota Dept.
of Transportation
Data Source: Newport Comprehensive Plan



For example, consideration is given to the storage capacity and nutrient stripping capabilities of wetlands, the elevation of a proposed development's first floor and the need for flood-proofing measures.

POTENTIAL IMPACTS FROM DEVELOPMENT

Development will change both the quality and quantity of surface water runoff from the site. The changes may occur during site construction and during on-going operations.

Construction Impacts

Construction activities, including construction of the proposed waste processing facility, increase the quantity and decrease the quality of runoff, primarily by removing vegetation and exposing bare soil to precipitation. Exposed soil will have a lower infiltration rate, and therefore a higher runoff rate, than the same soil with some type of vegetative cover. Exposed soil will also erode more easily than a covered soil, thus decreasing the quality of runoff.

Table 10 compares erosion rates associated with several types of land uses.

Table 10
REPRESENTATIVE RATES OF EROSION FROM VARIOUS LAND USES

	Metric Tons/ sq. km/year	Tons/ sq. mi./year	Relative to Forest
Forest	8.5	24	1
Grassland	85	240	10
Abandoned Surface Mines	850	2,400	100
Cropland	1,700	4,800	200
Harvested Forest	4,250	12,000	500
Active Surface Mines	17,000	48,000	2,000
Construction	17,000	48,000	2,000

Source: U.S. Environmental Protection Agency, Methods for Identifying and Evaluating the Nature and Extent of Non-Point Source Pollutants, Oct. 1973.

Construction sites monitored by the Council in 1980 (Oberts, 1982) have showed elevated levels of suspended solids, nitrogen, phosphorus, chlorides, lead, zinc and chromium.

The above impacts are dramatic, but short term in nature. Revegetation of a site after development, for instance, will tend to decrease runoff volumes and improve runoff quality. Mitigation measures are also available to minimize construction related surface water impacts.

The counties' proposal does have longer-term construction impacts. Fill will be imported in order to maintain the elevation of the building above the 100-year flood level, but will also result in the loss of wetland areas and their associated runoff storage capacity.

Impacts From On-going Operations

Once development of the site is complete, surface water impacts could stem from the changes in the type of land use on the site and the availability of surface water storage on-site.

Figure 17 shows land use and drainage changes that will occur when the site is developed. These changes, in particular the increase in the amount of impervious surface, will slightly increase the volume of runoff generated (Table 9). A decrease in the volume of on-site runoff storage capacity, from 5 to 1.7 acre-feet, will occur as well.

No impacts on surface waters from spilled waste materials are expected. Incoming trucks will be covered, preventing spillage. The proposed facility will have an enclosed tipping floor as well as covered areas for ash, RDF, ferrous and reject outloading. No regular, long-term outdoor storage of materials, and no uncovered outdoor storage, is proposed. The citizen drop-off area will contain three covered trailers for materials, as well.

If the site is flooded, any stored waste materials from the facility could possibly wash into the river. The probability of such an occurrence is negligible, however, because a) the facility will be built at an elevation above the 100-year flood level and b) the facility operators will be able to remove waste materials before flood levels encroach on the facility.

Wastewater from the facility should not result in adverse impacts. All wastewater will be discharged to sewers (see chapter on Provision of Public Services).

MITIGATION MEASURES

During Construction

A number of practices could decrease the impacts of construction on runoff quality and quantity. They include, but are not limited to, the following:

- o Staging development so that limited portions of the site are unvegetated at any one time;
- o Prompt revegetation of disturbed areas with quick-growing plant species; and
- o Mulching of disturbed areas prior to revegetation.

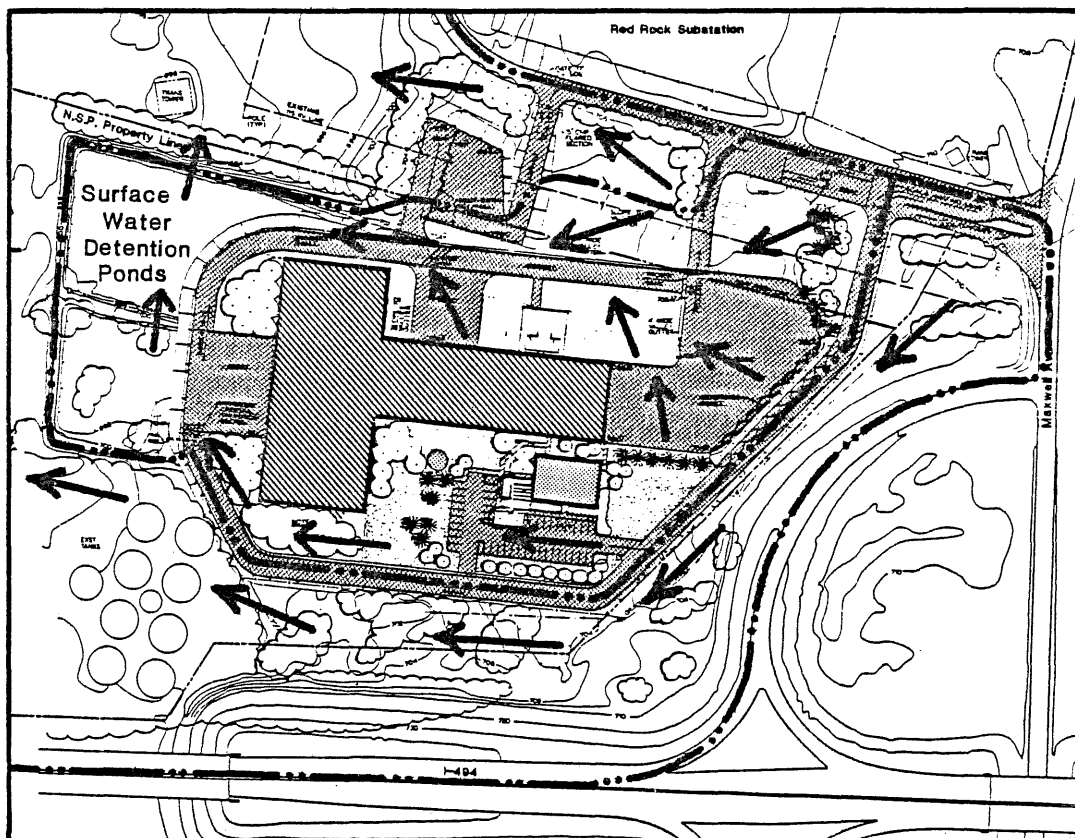
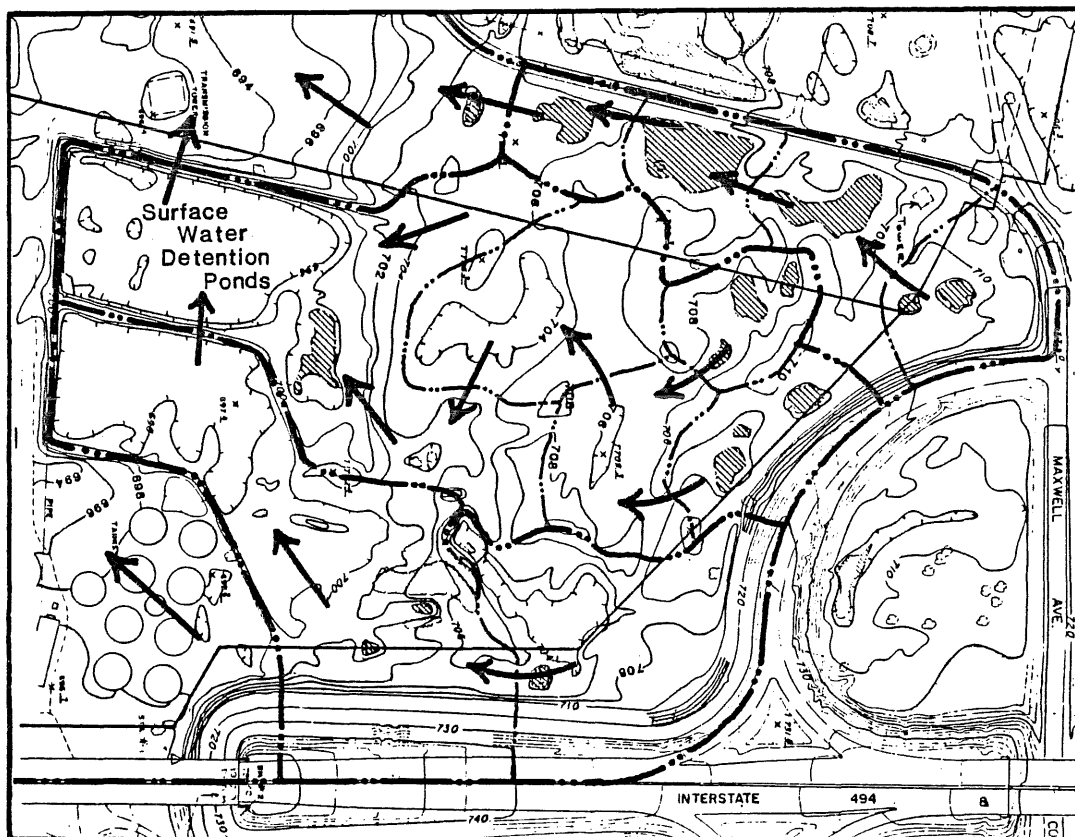
During Plant Operation

At a minimum, construction of ponding capacity sufficient to hold site runoff from the 100-year, 24-hour storm (about 9 acre-feet) could be built. The provision of such capacity could also help compensate for the loss of wildlife habitat that will accompany the loss of the existing wetlands (see Habitat chapter).

Runoff quality as it leaves the site could be improved in several ways. Runoff detention time in storage ponds could be engineered so as to maximize settling efficiency. A baffle wier or similar structure could be built to help keep oily substances associated with motor vehicles on the site.

A flood contingency plan could outline the procedures that would be followed in the event that a rare rainfall or snowmelt event threatened the facility with flooding.

**Figure 17. SURFACE WATER DRAINAGE
BEFORE AND AFTER CONSTRUCTION**



Base Map Source: Northern States Power Co.

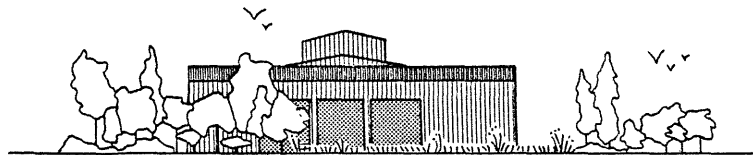
--- Watershed Boundary

← Direction of Flow

N
↑

0 200 400
Feet

HABITAT



HABITAT

EXISTING CONDITIONS

The Ramsey/Washington proposed project site has contained a number of types of habitat. Prior to development of the area, it may have contained wooded areas as well as wetlands. The construction in the mid-1900s of a slaughter house to the south drastically changed the character of the site. A holding pond and some wastewater treatment facilities were built on the western edge of the site, while the remainder was used as a feedlot and holding area for cattle. After highway 494 was built and the slaughter house closed, the site was essentially abandoned, except for the placement of utility lines. Grasses and wetland vegetation now exist on the site, as well as scattered trees and thin woodlands (Figure 18).

The numerous small wetlands that now exist on the site provide habitat for a number of animals, including waterfowl, upland game birds, songbirds, deer, small mammals, reptiles and amphibians. Altogether, approximately 5 acres of wetlands exist on the site.

The Department of Natural Resources' (DNR) data files do not indicate the presence of any sensitive ecological features on the site. No on-site survey by the DNR has been conducted, however. A cursory examination of the site by Corps of Engineers personnel indicated that types II, III and IV wetlands appear to exist on the site. A survey by Fish and Wildlife Service personnel also identified the wetlands and concluded that endangered species are not present.

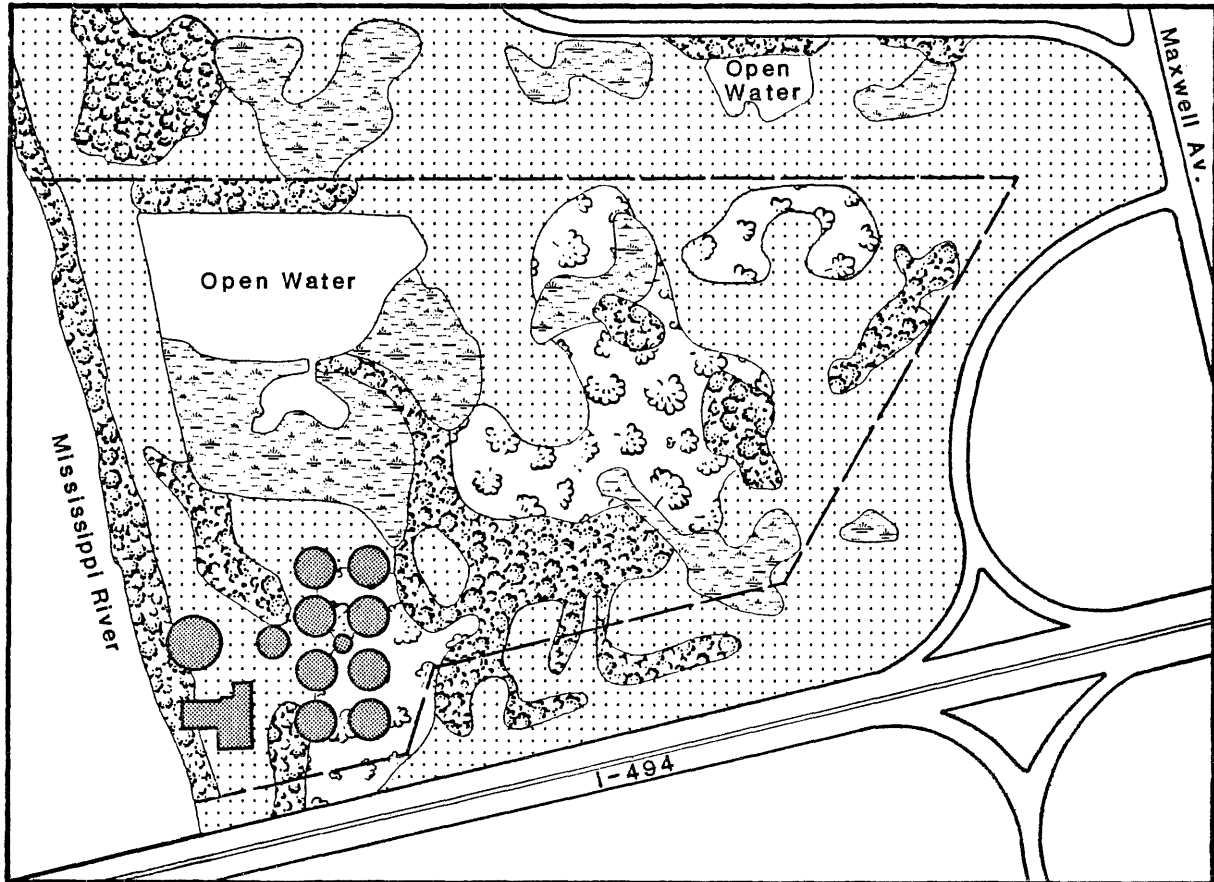
DEVELOPMENT IMPACTS

Perhaps the most obvious impact associated with development is the loss of wetland habitat. Only 1.7 acres of wetland will remain after the project is built. Much of the original wetland habitat will disappear as fill is placed on the site prior to facility construction. The acreage of open space will decrease from 3 acres to about one-half acre. The amount of thin woodlands will increase very slightly as the grounds for the facility are landscaped. Loss of the wetland and other habitats will cause declines in the on-site populations of animals that are dependent upon them.

No adverse impacts on the habitat value of the Mississippi River are expected. No wastewater will be discharged to the river. Stormwater will be discharged, however. Implementation of the mitigation measures outlined in the Surface Water chapter will minimize stormwater impacts.

In a broader context, use of this site may prevent adverse impacts on certain wetlands in the Twin Cities Metropolitan Area by reducing the need for landfills and by changing the character of the wastes going to landfills. Some existing landfills (such as Flying Cloud in Eden Prairie and Woodlake in Medina) are located close to wetlands and may adversely impact their habitat value. Other candidate landfill sites are also located near or adjacent to wetlands (such as Site D in Oak Grove). The proposed project will help reduce the demand for capacity at existing and proposed landfill sites. It will also decrease the probability of adverse impacts on wetlands near landfills by removing many of the substances which can contribute to contaminants in

Figure 18. EXISTING ON-SITE VEGETATION



- | | |
|---|---|
|  | OPEN WATER |
|  | PREDOMINANTLY WETLAND, SOME GRASSES AND SHRUBS |
|  | PREDOMINANTLY OPEN DECIDUOUS WOODLAND |
|  | PREDOMINANTLY LOW-LYING SHRUBS, SCATTERED DECIDUOUS TREES |
|  | PREDOMINANTLY GRASSLAND, SCATTERED SHRUBS AND DECIDUOUS TREES |

leachate. These substances include the portion of the organic fraction of the waste that will be removed and used as RDF. The residuals from the facility will be composed primarily of substances such as grit, glass and unrecovered secondary materials which are less likely to pollute groundwater, and subsequently surface waters such as wetlands.

MITIGATION MEASURES

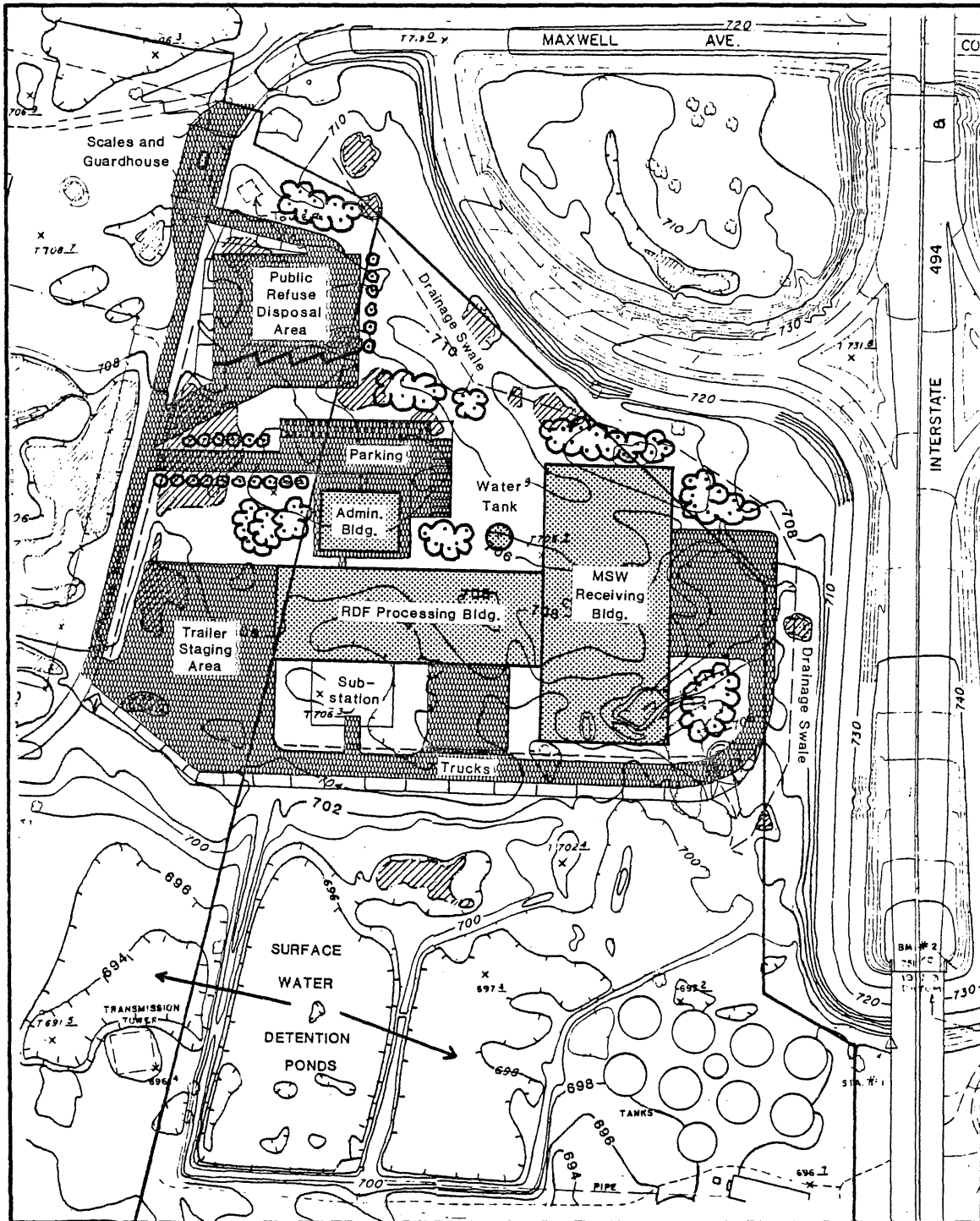
Preservation of wetland habitat or replacement of wetland habitat should be a priority. The Newport Critical Area Plan states that "Wetlands and low areas should be preserved for their natural function and capacities for holding stormwater runoff." Federal regulatory processes require an exploration of alternatives to impacts on wetlands for similar reasons.

The proposed project will help avoid potential impacts on wetlands by abating the need for landfills. Nevertheless, several wetland mitigation options could also be applied at the project site in question. First, the site layout could be altered so as to avoid wetlands or conserve space for the creation of new wetlands. Figure 19 contains one layout that would provide for more wetland acreage than the proposed layout.

Second, wetland areas could be managed selectively. That is, some wetlands could be managed so as to maximize their utility as habitat, while others could be managed so as to minimize their attractiveness to wildlife. For instance, one ponding area could be used primarily as a settling basin and a pollutant trap, while downstream ponding or wetland areas are managed to attract wildlife. Such selective management would help ensure that any degradation of on-site runoff would not affect wildlife species. In the case at hand, stormwater could be directed first to proposed detention pond number 2 for settling, and then to detention pond number 1 for wildlife purposes.

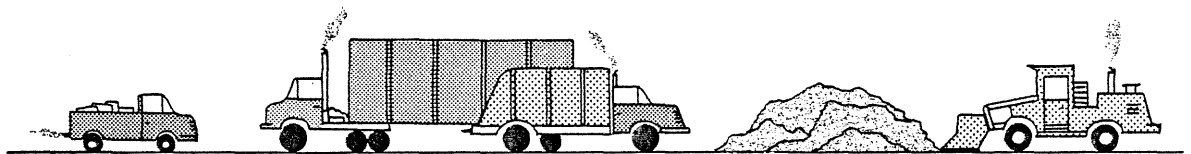
The construction of other ponding areas would further compensate for the loss of existing wetland habitat. Wetland areas could be provided and managed either to the north or to the south of the proposed detention ponds. The additional wetlands would also help retain runoff from the site (see Surface Water Chapter).

Figure 19.
ALTERNATIVE SITE LAYOUT



Base Map Source: Northern States Power Co.

AIR QUALITY



AIR QUALITY

TRAFFIC

The Metropolitan Council contracted with Environmental Resources and Technology, Inc. to analyze air quality impacts from traffic. The document containing the analysis was incorporated by reference in the EIS Executive Summary. This section summarizes the consultant analysis of air quality impacts.

Four pollutants from transportation sources are regulated: hydrocarbons, oxides of nitrogen, carbon monoxide and lead. Hydrocarbons and oxides of nitrogen interact in the presence of heat and sunlight to form ozone. Ozone formation is a regional scale phenomena, not a localized air quality problem. The MPCA has undertaken an extensive ozone monitoring program in recent years and has begun to investigate the possibility of reclassifying the Twin Cities as an area in which the ambient ozone standard is attained.

The proposed project will produce no significant change in the amount of annual regional emissions of hydrocarbons and nitrogen oxides. To the degree to which the project represents a shorter haul trip than the no-build alternative, it will produce correspondingly lower emissions.

Carbon monoxide (CO), in contrast, is a pollutant with localized, not regional, impacts. The objective of the indirect source air quality analysis is to determine the existing and future ambient CO concentrations at potentially high traffic areas located in the vicinity. The Maxwell Rd. intersections with each of the I-494 ramps were analyzed. CO levels were modeled based on traffic in the site vicinity and emissions from regional or "background" sources. The prediction of CO concentrations was calculated using conservative assumptions about environmental factors and the following methodology: (1) vehicular emissions methodology for intersections from the EPA Indirect Source Guidelines "Vol. 9", (2) the EPA computer program Mobile 3 to obtain CO emissions factors, and (3) the EPA-approved line source dispersion model Caline 3 to obtain CO concentrations.

The existing 1985 conditions show that the 1-hour and 8-hour CO concentrations from local traffic and background regional sources total $6,090 \text{ ug/m}^3$ for CO-1 and $4,265 \text{ ug/m}^3$ for CO-8. The corresponding ambient standards are $40,000 \text{ ug/m}^3$ and $10,000 \text{ ug/m}^3$, respectively - more than twice as high.

Conditions in 1988 are presumed to be affected by a 7.5 percent increase in traffic volume that will be offset by improved automobile pollution control devices. A slight reduction in modeled concentrations is forecasted. The addition of anticipated project related traffic is predicted to contribute to total CO concentrations at the two intersections of $6,090 \text{ ug/m}^3$ for CO-1 and $4,265 \text{ ug/m}^3$ for CO-8. No change in CO concentration is anticipated relative to baseline conditions associated with the project.

The lead concentration in air has declined dramatically in recent years due to the shift to leadfree fuels. Current levels are less than a fifth of the 1.5 ug/m^3 standard. Traffic volumes associated with the facility are too low to emit significant amounts of lead and much of it will use diesel fuel that is not a lead source.

No significant potential adverse air quality impact from the traffic associated with the facility is anticipated and no mitigative measures are offered for consideration.

ODOR

Impacts from odor are not anticipated to be significant, although it is impossible to completely eliminate refuse-associated odors. During transportation to the facility, odors will be contained within the vehicles transporting the wastes. Once at the facility, odor impacts from unprocessed refuse will be minimized by preventing the discharge of odors into the external environment: the tipping and processing floors will be enclosed, with the exception of the doors used for the entrance and exit of trucks. In addition, a reodorant spray system will be installed in the waste receiving area. Metered reodorant from the system will be used to neutralize odors and produce a lower overall odor level. Additionally, refuse will be removed from the tipping floor and processed immediately upon receipt. Immediate processing of the wastes provides the primary means of odor control by reducing the chances of partial decomposition. Residual odors from the tipping floor will be eliminated by cleaning and sweeping the tipping floor each night, and using a deodorant spray.

Once the RDF is separated from the waste stream, the potential for odor impacts will be further reduced. The RDF has no noticeable odor unless it is stored in large quantities over extended periods of time. Storage of RDF at this facility, however, is not anticipated; the material will normally be removed immediately after processing. In some cases short-term storage (up to 3 days) may occur.

An on-site visit by ERT, the Council consultant, to an existing RDF facility in Baltimore, Maryland confirmed that the odor generated by an RDF facility is minimal. The refuse at that facility was continually processed, thereby minimizing the potential for odor problems. The reodorant applied at the transfer station produced a pleasing odor. Some malodor was present in the facility, however, it was primarily restricted to a few areas in the processing stream at the top of the enclosed building. The waste was generally processed in the top half of the processing building above the open receiving doors; any slight odor and dust associated with the process seemed to be restricted to these areas. The air in the upper portions of the building was collected and subjected to a filtering process which reduced the odor. As a result of the constant circulation of air in the building, odor was not observed to be a problem.

DUST

Potential Impacts

Construction phase

During construction, dust emissions will result from earth moving, excavation, road building equipment and truck traffic. To minimize impacts, dust control techniques which may be employed during construction include staging development, watering exposed surfaces and roads and covering storage piles. The soil on-site consists primarily of poorly drained silt loams which are typically wet and not subject to excessive erosion. Therefore, it is not expected that dust generation should be a problem. If dust is generated, the site can be wetted to minimize dust formation.

Operations phase

There will be minimal impact from dust emissions during the operations phase of the project. Dust impacts from transportation of raw waste and processed materials will be minimal because the materials will be hauled in enclosed trailers. All access roads and parking areas will be paved. Raw municipal solid waste is sufficiently moist that the dust generation potential on the tipping floor in the receiving building is small.

Some dust generation inside the processing building is expected and dust collection systems will be installed in the building. Collection of fugitive dust, dust from air knives, the secondary shredder and the RDF conveyers will be accomplished by four independent and separate dust collection sub-systems. Each dust collection sub-system will have its own exhaust fan and dust collector. All dust collectors will discharge collected dust back to the process stream. In all cases, only clean air will be exhausted to the atmosphere. Exhaust air will be returned to the baghouse for filtration.

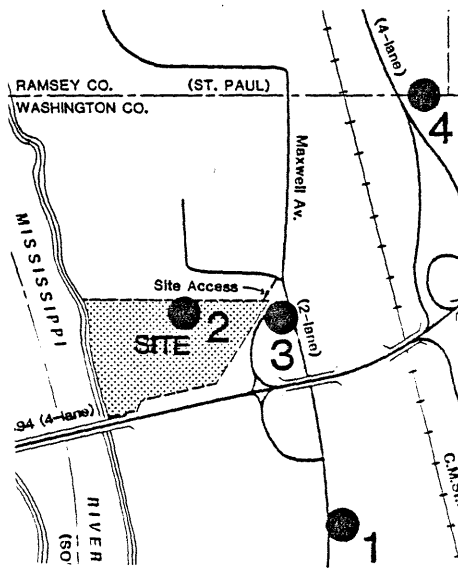
Mitigation Measures

Among the measures that could help minimize the potential for dust generation during construction are the following:

- o staging of development;
- o prompt revegetation of disturbed areas; and
- o watering of exposed areas.

Employees will be exposed to some dust during waste processing. In order to ensure their safety, they could be required to wear small air filters.

NOISE



NOISE

INTRODUCTION

Construction, daily operation and increased traffic associated with the project will all contribute to noise levels in the site vicinity. To help quantify their contribution, the Metropolitan Council contracted with Environmental Resources and Technology, Inc., to prepare a noise study; the document containing that study was incorporated by reference in the EIS Executive Summary. This chapter summarizes the noise study results.

Noise Concepts and Measurements

The noise study's results can best be understood if several concepts and measurements are understood first. One concept is that of "noise" itself. Generally, "noise" is defined as "unwanted sound." The perception of a sound as "unwanted" can vary between receivers; nevertheless, there are state and federal regulations controlling "noise" levels. The regulations were primarily developed to protect public health and safety.

A number of sound, and therefore noise, characteristics can be measured. Sound pressure is the most basic and common measure. It is measured in decibels (dB) on a scale that ranges from zero to 200. A reading of zero dB corresponds to the threshold of human hearing. It takes an increase of about two to three decibels before the average person perceives any noticeable increase in loudness, and an increase of 10 decibels before a person perceives a sound to be twice as loud.

Decibel readings can be "A-weighted." A-weighting adjusts the decibel reading to reflect more closely the human ear's sensitivity to various sound frequencies.

A-weighted measurements (dBA) can be reported as real time measurements, or as statistical descriptors. In the first case, the dBA level recorded at a particular instant in time is reported, or several instantaneous measurements are averaged together and reported as an average dBA level. In the second case, noise is monitored for a particular period of time, and the dBA levels exceeded for certain portions of that time are reported. The L_{90} values (the noise level exceeded 90 percent of the time) is considered background. The L_{50} level represents the median noise level. The L_{10} level (the noise level exceeded 10 percent of the time) generally reflects higher noise levels that are caused by passing motor vehicles or aircraft.

EXISTING CONDITIONS

Site Characterization

To characterize a community's noise environment adequately, it is generally necessary to look at a) noise-sensitive receptors, b) noise sources, c) terrain features and d) resulting noise levels.

The closest noise sensitive receptors to the proposed site are a residence 1,800 feet to the northeast and a residence 2,500 feet to the southeast (Figure 20.)

Existing noise sources noted during the study included vehicle traffic on I-494, Hwy. 61 and Maxwell Rd., Knox Lumber Co., an NSP substation, and North Star Steel. To the north of the site is a trailer truck parking area and to the south is Newport Cold Storage Co..

The terrain around the proposed project site and potential noise receptors is generally flat (Figure 13). I-494 and a high berm separates the site from the southeastern residential receptor, however, while Hwy. 61 separates the site from the northeastern residential receptor.

Existing Noise levels

Noise levels on the proposed site and at the two residential receptors was conducted during one week in January during both daylight and nighttime hours (Figure 20). Tables 11 and 12 summarize the dBA levels recorded at the monitoring sites. Most of the readings taken are typical of noisy to very noisy urban residential areas. The major source of both day and nighttime noise in the project vicinity is traffic on I-494 and Hwy. 61. Some additional noise from industrial activities near Maxwell Rd. also occurs.

Table 11
MEASURED COMMUNITY NOISE LEVELS (dBA)

Site	Date ¹	Hour ²	L ₅₀	L ₁₀
1	1/28	04:50 a.m.	59	82
1	1/29	10:35 a.m.	51	58
1	1/30	08:35 a.m.	60	66
1	1/31	11:50 p.m. (n)	49	54
2	1/28	05:15 p.m.	53	56
2	1/30	07:45 a.m.	57	69
2	1/31	11:30 p.m. (n)	44	46
3	1/30	08:05 a.m.	60	75
3	1/31	04:30 p.m.	57	63
3	1/31	12:15 a.m. (n)	49	60
4	1/30	09:15 a.m.	65	71
4	1/31	05:00 p.m.	64	72
4	1/31	12:45 a.m. (n)	54	61

¹Year 1985.

²"n" refers to "night" (10 p.m.-7 a.m.) measurements.

Source: ERT, 1985.

Existing daytime noise levels frequently exceeded or approached the MPCA's L₁₀ and L₅₀ limits for residential areas, even at the two residential sampling points (Table 13). Commercial daytime L₁₀ limits were exceeded on three sampling occasions and L₅₀ limits on one. Daytime industrial L₁₀ limits were exceeded once, at one of the residential receptors.

Figure 20. NOISE RECEPTOR LOCATIONS

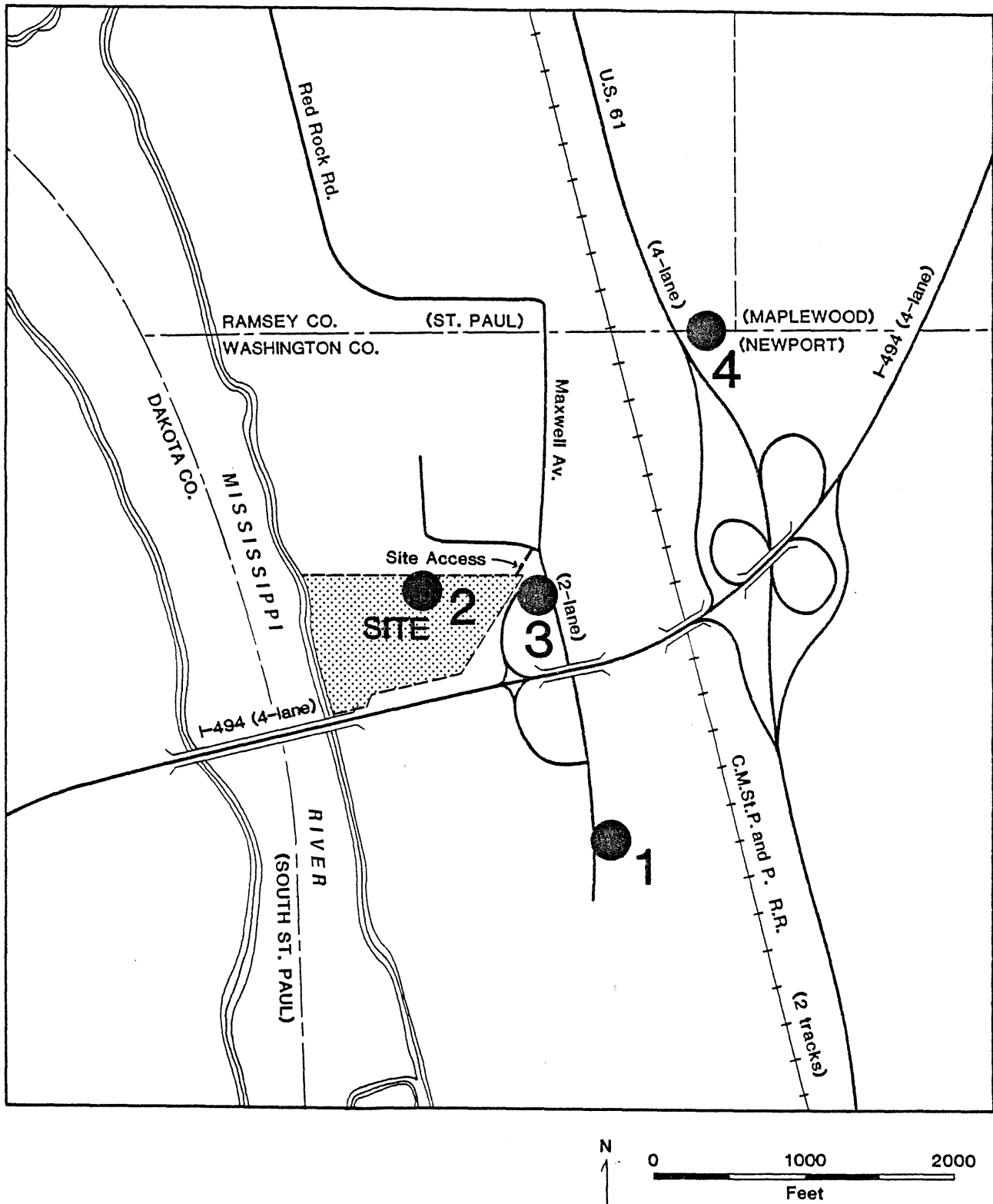


Table 12
MAXIMUM AND MINIMUM MEASURED "A"-WEIGHTED NOISE LEVELS (dBA)*

Site	<u>Maximum</u>					<u>Minimum</u>				
	Date	Hour	Day	L ₅₀	L ₁₀	Date	Hour	Day	L ₅₀	L ₁₀
1	1/28	04:50 p.m.	Mon	59	82	1/29	10:25 a.m.	Tues	51	58
2	1/30	07:45 a.m.	Wed	57	69	1/31	11:30 p.m.	Thur	44	46
3	1/30	08:05 a.m.	Wed	60	75	1/31	12:15 a.m.	Thur	49	60
4	1/31	05:00 p.m.	Thur	64	72	1/31	12:45 a.m.	Thur	54	61

*Where maximum level was determined by highest L₁₀ value and minimum level was determined by lowest L₁₀ value.

Source: ERT Field Monitoring Program 1/28 through 1/31, 1985. ERT.

Table 13
MPCA AMBIENT NOISE LEVEL LIMITS
bBA

Noise Area Classification (NCA)	Day (7 a.m. - 10 p.m.)		Night (10 p.m. - 7 a.m.)	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀
NAC 1 (residential areas)	65	60	55	50
NAC 2 (commercial areas)	70	65	70	65
NAC 3 (industrial areas)	80	75	80	75

During nighttime hours, residential L₁₀ and L₅₀ limits were approached or exceeded twice. No nighttime exceedences of the commercial or industrial area limits occurred.

POTENTIAL IMPACTS

Impact Criteria

Noise impact can be evaluated based on whether a) specific governmental laws or regulations are exceeded and b) whether it appears receptors will be adversely affected to some extent.

No federal regulations directly apply to community noise that may result from the proposed project, however, the MPCA's noise limits (Table 13) do apply. The MPCA's limits are receptor based, that is, the noise area classification that applies in a given situation depends on the nature of the land use at the point the noise is heard by the receptor. If the receptor is in a residential area, NAC 1 limits apply; if the receptor is in an industrial setting, the NAC 3 limits apply.

Noise Levels Associated with Construction

Facility construction will occur over about a 24-month time period. During that time, noise levels will vary depending on the activities taking place. Table 14 summarizes modelled noise levels for the construction period for the nearest sensitive receptors, the residences to the northeast and southeast.

Table 14
PREDICTED CONSTRUCTION NOISE LEVELS¹
(L₁₀, dBA)

Construction Phase	Southeastern Residence	Northeastern Residence
Excavation	62	57
Concrete pouring	58	53
Steel erection	62	57
Mechanical	57	52
Clean-up	52	47
Existing daytime	82 ²	72

¹Indicated construction noise levels represent the total of existing measured noise and the noise due to a particular phase of construction; in many cases existing noise sources dominate over the noise effect of construction activities.

²Outdoor loudspeaker in proximity to microphone.

Construction will normally be limited to daylight hours. Table 14 reveals that during those hours, noise from construction will be lower than existing noise levels at the residential receptors.

Heavy duty trucks will also contribute to construction noise. The anticipated maximum additional peak truck trips of 10 per hour attributable to the facility's construction phase will have no discernible effect on noise levels at the closest residential receptors.

Noise Levels Associated with Operations

The major sources of outdoor noise from the facility will be draft fans, the baghouse and trucks. A comparison of baseline and future predicted noise levels are presented in Table 15.

Noise from the project would be most noticeable during the quietest times during the day, such as early morning. The data show, however, that noise levels from the facility will be in compliance with MPCA guidelines for the site itself. Exceedences of residential area noise level guidelines will occur (Table 15). In all of those cases, however, baseline noise levels are already at or exceed the MPCA guidelines. Furthermore, the increase attributable to the facility is very small, ranging from 0.1 to 1.5 dBA. The small increase associated with the facility should not be perceptible to the residential receptors because it is less than three decibels.

Overall, noise levels in the site vicinity will not be affected significantly by construction or operation of the proposed facility. Existing noise levels are already high, and will largely mask noise from the facility.

Table 15
COMPARISON OF BASELINE AND FUTURE PREDICTED NOISE LEVELS, (dBA)

Noise Level Condition	<u>Site No. 1</u>		<u>Site No. 2</u>		<u>Site No. 3</u>		<u>Site No. 4</u>	
	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀
Baseline ¹								
Minimum	49D	54N	44N	46N	49N	60N	54N	61N
Maximum	60D	82D	53D	69N	60D	75D	65D	72D
Night	49	54	44	46	49	60	54	61
Future (Project Operation) ²								
Day	61.5*	82	62.5	70.1	63.5	75.3	65.4*	72.1*
Increase	1.5	0	6.5	1.1	3.5	0.3	0.4	0.1
Night	49.2	54.5	46.2	52.2	49.6	66.3	54*	61.1*
Increase	0.2	0.5	2.1	6.2	0.6	6.3	0	0.1

*Exceeds Minnesota Pollution Control Agency (MPCA) Noise Standards - Chapter 7010 and Draft 12.

¹Based upon noise measurements; daytime levels (D); nighttime levels (N).

²Future noise levels representing effect of project, project traffic, plus baseline noise.

MITIGATION MEASURES

Noise from the facility is not expected to significantly affect any nearby sensitive receptors. Nevertheless, the project proposers may take steps to minimize indoor and outdoor noise levels. Measures that will be incorporated include:

- o Delivery and sorting of waste in an enclosed and insulated building;
- o Use of special quiet-running fans in the RDF process;
- o Enclosure of shredding equipment;
- o Enclosure of other processing equipment;
- o Use of noise-suppression equipment, including mufflers, on mobile equipment such as front-end loaders; and
- o Use of rubber sound-absorbing material to eliminate metal-to-metal contact in rotating processing equipment.

HISTORICAL/ARCHAEOLOGICAL RESOURCES



HISTORICAL/ARCHAEOLOGICAL RESOURCES

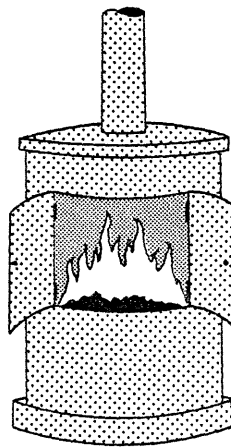
A site of historical or archaeological value is a location of a significant event, a prehistoric or historic occupation or activity, or a building or structure whether standing, ruined or vanished, where the location itself maintains a historic or archaeological value regardless of the value of any existing structures.*

The Minnesota Historical Society has indicated that it is very unlikely that significant historic or prehistoric properties exist in the project area.** Aerial photographs spanning the period from 1936 through 1964 indicate severe impacts during this period from the construction of stockyards and sewage treatment facilities. Consequently, no traces of previous cultures are likely to be found on the site despite the probability that the general vicinity harbors archaeological artifacts.

*U.S. Department of the Interior
1978 National Register of Historic Places and Comprehensive Statewide
Historic Survey and Plans, Criteria, Determinations of Eligibility and
Guidelines. Federal Register 42(183). September 21, Part III. National
Park Service, Washington D.C.

**Minnesota Historical Society, Letter to the Metropolitan Council, February
13, 1985.

REGULATION OF COMBUSTION EFFECTS



REGULATION OF COMBUSTION EFFECTS

The RDF will be burned in dedicated boilers at other NSP facilities, namely the Red Wing and Mankato electrical generation plants. Although the air emissions and ash resulting from the combustion of the RDF are not directly related to the RDF processing plant, a description of the regulatory process controlling this activity is appropriate. Air emissions and ash disposal are both regulated by the Minnesota Pollution Control Agency (MPCA) permit process.

Perspectives on combustion effects should reflect an awareness of the need for a balanced approach to disposal problems. Waste reduction, reuse, composting, landfilling and combustion each have an important role. Combustion results in efficient mass and volume reductions of material that is not reused through recycling and composting programs. Furthermore, it can effectively break down toxic and hazardous chemicals while producing energy. In comparison with landfills, its impacts are more controllable. For instance, incinerators can be closed down to stop identifiable problems whereas contamination from a landfill will continue after it is closed. Nevertheless, adequate control measures should be maintained to minimize emissions to the air.

AIR EMISSIONS

NSP obtained an Air Emissions Facility permit during 1984 to burn RDF and other fuels in its Red Wing plant. It is currently applying for a permit to use its Mankato plant for the same purpose and anticipates that this permit will be issued in March 1985. These permits are generally effective for five-year periods. The permit applications specifically identify the intent to burn RDF from Ramsey and Washington Counties as well as from other Metropolitan Area counties.

The MPCA permit analysis identifies several advantages of burning in existing boiler furnaces rather than in new or existing incinerators. Boilers tend to have conditions more conducive to complete combustion such as higher temperatures, more precise metering of fuel and air, and better emission control equipment. Future emissions were estimated based on RDF consumption of 150,000 tons per year and found to be acceptable. The RDF estimate is lower than the 196,000 tons per year the project is projected to produce by processing 900 tons per day of municipal solid waste (MSW) because 60,000 tons of RDF per year are expected to be burned at the Mankato plant. The future emission estimates, based on a U.S. Environmental Protection Agency (EPA) model for incinerator operations burning raw refuse, are believed to overestimate emissions with certain exceptions. The exceptions relate to chemicals that may be somewhat concentrated through RDF processing or are by-products of high temperature burning. These chemicals were not found to present unacceptable risks in the MPCA testing of RDF combustion.

The MPCA analysis documented an EPA evaluation of dioxin emissions from five large-scale refuse burning facilities around the U.S. EPA concluded that dioxin emissions from these facilities do not represent a health threat to nearby residents and that it would not develop regulations for dioxin emissions from these facilities. The MPCA estimate of dioxin ground level concentration at the Red Wing plant was 1/1,320 of the acceptable ambient level of dioxin on a 24-hour basis--a considerable safety margin.

The MPCA further evaluated 18 toxic substance pollutants that could be

emitted. Assuming a worst-case scenario without ash retention or emission control collection, 13 of the substances were below trace levels and the other five were below one percent of acceptable threshold limit values. Electro-static precipitator collection and opacity monitoring equipment were specified in the permit to reduce these levels by possibly more than 50 percent.

To ensure protection against unacceptable toxic releases, further testing and reporting by NSP is required after regular RDF burning begins. This testing will address heavy metals, volatile organic compounds, polynuclear aromatic hydrocarbons and acid gasses.

The MPCA issued the permit based on the following conclusions:

1. The proposed operation of this facility will meet applicable regulations by a wide margin.
2. Processing municipal solid waste into RDF and burning this fuel in boilers offers environmental and economic advantages over direct firing of municipal solid waste in municipal incinerators.
3. The emission of toxic substances has been studied and the results indicate that the discharge will not exceed acceptable levels. However, toxic substance emissions will be further studied after RDF burning commences.

Special conditions for operation and future adjustments address:

- Operation of air pollution equipment
- Emission limitations
- Enclosure of fuel handling and storage facilities
- Maintenance of plant and grounds
- Noise standards
- Ash standards
- Fuel usage
- Economic analysis of alternative pollution control equipment
- Breakdown or shutdown reporting
- Additional testing
- Reporting requirements

The permit process described above is comprehensive and adequately provides for continued monitoring to assure that air emissions will not constitute a public health threat. Furthermore, the permit will allow the MPCA to require additional controls for toxic and acid gasses if warranted by monitoring data or new justifications for mitigative measures like scrubbers. The potential impacts from RDF combustion air emissions appear to involve much less risk than the groundwater and air quality impacts that would result from continuing to landfill mixed MSW.

ASH DISPOSAL

The Air Emissions Facility permit addresses ash disposal by requiring compliance with specified Solid and Hazardous Waste Rules of the MPCA (6 MCAR 4.0004 and 4.0021, respectively). In addition, NSP shall prepare and submit disclosure information and waste management plans if requested by the MPCA. It is anticipated that both the fly ash and bottom ash will be disposed of at the Red Wing Sanitary Landfill. This will require a "co-disposal" permit from the MPCA because the ash will be categorized as an industrial waste being co-disposed with MSW.

The co-disposal permit requires testing according to EPA standards to determine toxicity. If the wastes are determined to be hazardous, Hazardous Waste rules specify disclosure as well as on-site treatment or storage and disposal requirements.

If the wastes are not identified as hazardous, their chemical composition must be determined and additional leach testing may be required to determine landfill disposal requirements. A schedule for ongoing compliance testing will be negotiated during the permit process. The sanitary landfill that receives the waste must also meet permit standards for engineering, liners, leachate collection and other requirements.

A comprehensive review of the impacts of incinerator fly ash and bottom ash disposal was completed in 1982 for Los Angeles, San Diego and San Francisco counties.* The report compared leachate characteristics of the ash with that of solid waste and presented data showing that results between RDF ash and raw MSW were not distinguishable. Tests consistently showed that both ash from raw MSW and combined fly ash and bottom ash from RDF combustion could be classified as nonhazardous. Furthermore, the alkalinity of the combined ash appeared to stabilize metal content and reduce leachate metal concentrations when co-disposed with MSW.

The ash disposal permit requirements appear to be comprehensive and adequately provide for the continued monitoring necessary to assure that disposal in landfills will not constitute a public health threat. The available experimental data suggests that adverse impacts from land disposal of ash, even in combination with the associated effects of air emissions, will be less than from the disposal of the raw MSW in landfills. Efforts to achieve county waste management goals for waste reduction, recycling and composting may reduce the amount of RDF that is produced and combusted.

ADDITIONAL INFORMATION

Analysis about refuse combustion and related air emissions and ash disposal implications was conducted and presented in the Draft Ramsey/Washington Waste-To-Energy EIS the Metropolitan prepared in 1984 for the mass-burn option in Lake Elmo. This document was incorporated by reference in the EIS Executive Summary and is available upon request.

* Rigo & Rigo Assoc., State-of-the-Knowledge Report on the Disposal of Incinerator Ash, 1982.

LIST OF PREPARERS

LIST OF PREPARERS

Environmental Quality Board Rules require the EIS to include a list of the names and qualifications of the persons primarily responsible for preparing the EIS and significant background reports.

METROPOLITAN COUNCIL

Many members of the Council's staff as well as representatives of other agencies have assisted in the preparation of the EIS. The individuals with primary responsibility for preparation of the document, however, are:

Wayne Nelson - Environmental Planner
B.A. University of Minnesota

Karen Harrington - Associate Environmental Planner
B.A. University of Minnesota
M.A. University of Minnesota

and

Craig Skone - Planning Assistant
B.A. University of Minnesota

OTHERS

Environmental Resources and Technology, Inc., was retained to provide specialized analysis focusing on the four topics listed below with corresponding information about the primary preparers. The coordinator of this consultant study was:

John Caban - Project Manager
B.A. Brandeis University
M.S. University of Pittsburgh

Processing Technology Alternatives

Jeffrey Paul - Planner
B.A. Colby College
M.A. Tufts University

Project Size Alternatives

Thomas Yeransian - Engineer
B.S. Tufts University

Transportation and Noise Analysis

Christian Bibbo - Transportation Engineer
B.S. University of Massachusetts
Jeffrey Paul - Planner
B.A. Colby College
M.A. Tufts University

Air Quality Assessment

Anthony Colella - Meteorologist
B.S. Lowell University

RAMSEY/WASHINGTON WASTE-TO-ENERGY FACILITY
ENVIRONMENTAL IMPACT STATEMENT ATTACHMENT

INTRODUCTION

In April, 1985, the Metropolitan Council released the draft environmental impact statement (EIS) on the Ramsey/Washington Waste-to-Energy facility. The Council held a public meeting on April 23, 1985, to receive oral and written testimony on the draft. The meeting record was held open until May 3, 1985. The Council considered the comments received and has added the information noted below in order to complete the EIS in its final form.

The Environmental Quality Board rules provide that "If only minor changes in the draft EIS are suggested in the comments on the draft, the written comments and the responses may be attached to the draft or bound as a separate volume and circulated as the final EIS." Only minor changes to the draft EIS on the Ramsey/Washington project were warranted by the public comments. Minor editing changes were also made in the draft document. The most significant of the editing changes was to correctly identify the Council's EIS consultant as Environmental Research and Technology, Inc. The draft EIS together with this attachment constitutes the final EIS.

SUMMARY AND RESPONSE TO PUBLIC COMMENTS

VERBAL COMMENTS

Two persons testified on the project at the April 23, 1985 meeting. John Sauers, a consultant representing Sanitary Landfill Site, Inc., spoke first. Mr. Sauers asserted that the project was not in compliance with the federal Resource Conservation and Recovery Act (RCRA), that the process used to complete the EIS did not follow RCRA requirements and that the state of Minnesota does not have an EPA--approved solid waste plan. He said that because the state did not have an EPA--approved plan, any legislation adopted since the state's 1981 solid waste plan was not in compliance with federal law. Contracts between the counties and NSP have been let without approval of EPA, he stated, and noted that NSP had no track record in waste management. He feared that the counties would be unable to properly run or police the facility. Sauers said the 45 percent of the waste at the facility that is unusable is hazardous and, therefore, the facility must be treated as a hazardous waste facility by the regulatory agencies. Licensing procedures of the counties were not followed according to Sauers. He later pointed out that the RCRA definition of solid waste included hazardous wastes, and stated that he objected to the fact that a monopoly had been created.

Mike Hines, a waste hauler in Ramsey and Washington Counties, spoke next. Hines feared that waste trucks would not be able to get into and out of the facility in a timely manner, resulting in air pollution, traffic congestion and delays for haulers. He estimated that during peak use times, 70 to 80 trucks per hour would arrive at the facility, requiring a turn-around time of approximately one minute per truck. Hines requested that the Council require NSP to guarantee a 15-minute turnaround time for the haulers; if that time was exceeded, trucks should be allowed to leave, he said. Engineers that Hines consulted estimate that only 6 to 8 trucks can unload at the facility at once.

A few questions were asked by unidentified members of the audience. One person inquired as to the fate of the 3M project, and asked why it had been abandoned. Doug Wood, the project manager, replied it was terminated due to less favorable economics and the need to abate a greater portion of the counties' wastes. Another person asked why the facility was sited in a residential area. Wood answered that the site was zoned industrial, and that there were not many residences close by. He felt the project would fit in well with the other industrial activities in the area.

RESPONSES

Responses to Mr. Sauer's Comments

The provisions of RCRA are not applicable in assessing the adequacy of, and procedural requirements associated with, a state (EIS). RCRA deals primarily with regulating and permitting hazardous waste facilities; it also contains provisions relating to state solid waste planning. This EIS, mandated under the rules of the Minnesota Environmental Quality Board (6 MCAR S 3.039, subd. L.3.), does not purport to regulate or permit the proposed facility; it is strictly an informational document that can be used by regulatory agencies when they begin their permitting and/or review processes.

The Minnesota Pollution Control Agency (MPCA) does have an EPA-approved solid waste plan in place. The approval date was March 3, 1982. The EIS process would not be affected even if no approved state plan were in place: an EIS merely reports the potential impacts of a proposed project, and can be requested at any time by anyone who is interested in developing a project. The process outlined in the EQB's rules is the only procedural guide which applies to the preparation of a state EIS; that process has been adhered to in the preparation of the Ramsey/Washington Waste-to-Energy Facility EIS.

The proposed facility will accept only mixed municipal waste and therefore is unlikely to be considered a "hazardous" waste facility by regulatory agencies because it will receive only household quantities of hazardous waste. Hypothetically, if the facility should separate between 100 and 1000 kg of hazardous waste per month, it would be considered as a "small quantity generator" of hazardous wastes, for which no federal or state permits are currently required. The EPA will promulgate standards for small quantity generators by March 31, 1986; such standards must include a provision that certain small quantity generators obtain a RCRA storage permit. Under some conditions current laws and regulations require that generators of 1000 or more kilograms per month of hazardous waste obtain a hazardous waste storage permit from the MPCA. The EPA has designated the MPCA as the agency to issue the permits for hazardous waste facilities because the state has an EPA-approved solid waste plan. Text added for the final EIS reflects the above information concerning conditions under which a hazardous waste storage permit would be required.

Only five percent of the waste received at the facility (that fraction designated "unprocessible") has the potential to be hazardous waste requiring temporary storage before removal. The actual percentage of hazardous waste will be lower because unprocessible waste also contains items that are simply too large (for instance, mattresses) to be processed or that could foul processing equipment (long strands of metal cable, for example). The draft EIS already contains this information.

No county license for the facility has been granted yet; no permits or other governmental approvals for the facility can be granted until the final EIS is approved and released. The counties and NSP have signed a contract concerning development of the facility. The Metropolitan Council must review and approve or disapprove of the contract based on criteria in its Solid Waste Policy Plan. No EPA approval is required.

Response to Mr. Hine's comments

Mr. Hine's projection of peak traffic is somewhat high in comparison with the experience at other waste processing facilities. The large geographic area and variety of vehicle load capacities will tend to spread arrival times at the facility throughout each day. Nearby haulers are likely to avoid any delays by delivering at off-peak hours possibly with occasional partial loads.

Estimates based in part on the experience of a 1,200 ton per day facility--National Ecology's waste processing facility in Baltimore--are that peak hour traffic will be 17 percent of the daily total or about 38 vehicles. Hauler delays in admission to waste processing facilities is not known to be documented as a problem in the literature on such facilities. The convenient location of the site in Newport relative to landfill locations will substantially reduce average travel times for most haulers.

Assuming a worst case scenario of 250 trucks per day arriving only during a two hour morning and afternoon period, a maximum of 65 trucks per hour would have to be accommodated. This number is unlikely because 225 trucks is the upper limit of anticipated deliveries on any given entire day. The 65 trucks could easily be handled on the tipping floor where as many as 15 trucks can deposit at a time or 90 in an hour. Inspection and weighing will be slower, however, and mitigation measures should be considered.

Air pollution as a result of waiting packer trucks is not likely to become a problem in the vicinity. Existing local traffic conditions produce less than half the EPA ambient standards for carbon monoxide and one-fifth the lead standard. Diesel fuel emissions are not a lead source. Emissions of hydrocarbons and nitrogen oxides are a regional scale concern that is not discernably affected by a localized situation of this nature.

Additional text has been added (see below) to clarify the potential for problems with traffic congestion.

WRITTEN COMMENTS AND RESPONSES

Copies of the written comments submitted on the draft EIS, and the responses to those comments, are attached at the end of this document.

ADDITIONS AND CHANGES TO DRAFT EIS TEXT

(Page 43, Paragraph 4; replace with the following):

Specific hazardous waste storage procedures have not been proposed yet since the facility will not be operational for two years and the applicable regulatory controls are expected to change. At this time, no regulations govern the storage of hazardous wastes by small generators (those who generate between 100 and 1000 kg of hazardous waste per month). The EPA must promulgate standards for small quantity generators by March 31, 1986; however, those standards must

include a provision that small quantity generators who store between 100 and 1000 kg of hazardous wastes for over 180, or in some cases, 270 days, obtain a permit for such storage. If 1000 or more kilograms of hazardous wastes are generated per month at the facility and if that amount is stored on the site for over 90 consecutive days, the facility will be required, under current laws and regulations, to obtain a hazardous waste storage permit from the MPCA. The following general guidelines will be followed:

- o Hazardous wastes with flammable, reactive or explosive properties must be separated prior to processing;
- o Collected hazardous waste must be stored in accordance with MPCA rules (such as the hazardous waste generator standards);
- o If 1000 kilograms or more of hazardous wastes are generated and stored at the facility for over 90 consecutive days, an MPCA permit will be obtained;
- o Collected hazardous waste must be disposed of or treated at licensed hazardous waste management facilities - either an NSP boiler for organically comprised wastes or an out-of-state treatment or disposal site.

(Page 44, Add the following after the last paragraph in the Mitigation Measures section):

The counties could work closely with the Waste Management Board (WMB) and the MPCA in their efforts to better manage household hazardous wastes. County implementation of recommendations that the WMB and MPCA develop as a part of their studies, especially any recommendations that attempt to source separate or otherwise remove hazardous wastes from the mixed stream, could reduce the volume of such wastes which reach the facility.

(Page 60, Add the following prior to discussion of Potential Impacts):

Congestion Implications Within The Facility

Based on the generation of both commercial and residential waste in each county, 1,350 tons has been identified as the approximate upper limit of the amount of waste that will be received at the facility each day. If the average load delivered is six tons, a conservative estimate, 225 trucks is the maximum that will be unloading waste at the facility each day. Assuming a worst case scenario of 250 trucks per day arriving only between 9 and 11 a.m. and 1 and 3 p.m., 65 trucks per hour could arrive during these peak times.

Estimates based in part on the experience of a 1,200 ton per day facility--National Ecology's waste processing facility in Baltimore, Maryland--are that peak-hour traffic into the facility will be 17 percent of the daily total or about 38 vehicles. Hauler delays in admission to waste processing facilities is not known to be documented as a problem in the literature on such facilities.

The facility can accommodate 15 trucks on the tipping floor at one time and ten minutes should provide ample time to enter the facility, unload and leave. Consequently, 90 trucks per hour could conceivably use the facility and there appears to be ample flexibility to accept peak delivery volumes on the tipping

floor. A bottleneck could develop at the scale/guard house, however, in connection with the inspection and weighing of vehicles. This operation is projected by NSP to use as much as two minutes per truck. Only 30 trucks per hour would be admitted at this rate. Consequently, adjustments in the admission process would be required to receive the maximum anticipated truck volume of between 38 and 65 vehicles per hour. The tipping floor appears to be designed to accept the maximum anticipated traffic flow.

In the event of delays at the facility approximately 40 packer trucks should find space to wait. There is space for 25 vehicles between Maxwell Rd. and the scale and 15 vehicles in plant parking areas. This amount of space should be ample for reasonable delays.

(Page 60, Potential Impacts --Additional paragraph):

There is a possibility that delays could occur under peak use conditions because of the time associated with inspecting and weighing trucks near the plant entrance. Since every truck must be inspected and weighed prior to admission to the processing facility, approximately 30 trucks per hour can be admitted under current operational expectations. This admission rate is not adequate to accommodate maximum hourly delivery volumes ranging between 38 and 65 packer trucks. Upon admission, substantially more than 65 trucks per hour should be able to unload on the tipping floor.

(Page 60, Mitigation Measures --Additional paragraphs):

Inspection and weighing is the slowest procedure limiting traffic flow through the facility. Many trucks can be weighed within one minute, but inspection is important and more time consuming. Part-time staff for the peak hour traffic, particularly between 9 a.m. and 1 p.m., could be retained to accelerate this process. Inspections could also be performed off site at a convenient location by county staff. A second scale and inspection area could be developed. Weighing of empty trucks can be minimized with a periodic certification process involving verification of empty weights during off-peak hours. Haulers could be induced to avoid peak hours through a credit system for use at off-peak times. Partial loads during peak hours could be recorded to reduce credits earned for off-peak deliveries. Hours of operation could also be extended into the evening.

A transfer station or stations would substantially reduce traffic to the facility. Transfer vehicles would not require regular inspection or weighing at the facility because those activities would be conducted at the transfer station. Total travel time for haulers assigned to a transfer station would be substantially reduced as well.

WRITTEN COMMENTS AND RESPONSES

This section of the attachment contains the written comments on the DEIS and the Council's responses. Comments from state agencies are printed first, followed by comments from local governments, private organizations and individual citizens. Where responses to a letter are warranted, they can be found immediately after the letter they refer to. Changes to the EIS text that were made in response to the letters complete the attachment.



FOUNDED IN 1849

MINNESOTA HISTORICAL SOCIETY

690 Cedar Street, St. Paul, Minnesota 55101 • (612) 296-6126

April 22, 1985

Ms. Sandra S. Gardebring
Metropolitan Council
300 Metro Square Building
Seventh and Robert Streets
St. Paul, Minnesota 55101

Dear Ms. Gardebring:

RE: Ramsey/Washington Waste-to-Energy
Project
Newport, Minnesota

MHS Referral File Number: U-824
(PLEASE REFER TO THIS NUMBER IN
ALL FUTURE CORRESPONDENCE)

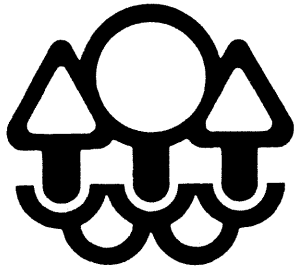
Thank you for providing us with a copy of the draft EIS for the above referenced project. The sense of our comment on potential impacts on historic or archaeological sites is conveyed on page 88

If you have any questions on our review, please contact Ted Lofstrom, Environmental Assessment Officer, Minnesota Historical Society, Fort Snelling History Center, St. Paul, Minnesota 55111.

Thank you for your continued close attention to historic values in your planning process.

Sincerely,

Russell W. Fridley
State Historic Preservation Officer



Minnesota Pollution Control Agency

May 1, 1985

Ms. Sandra S. Gardebring
Chairman
Metropolitan Council
300 Metro Square Building
7th & Robert Streets
St. Paul, Minnesota 55101

Dear Ms. Gardebring:

RE: Ramsey-Washington Waste-to-Energy Project, Draft Environmental
Impact Statement (EIS)

The Minnesota Pollution Control Agency (MPCA) staff has completed its review of the subject document. Overall, the draft EIS was well prepared. The staff does, however, recommend a more extensive discussion of ash disposal considerations. The discussion of the RDF alternative should be expanded to include co-composting of the heavy fraction. The staff would also recommend revisions to the discussion of the co-composting alternative. Lastly, we list a number of minor corrections which should be made to the text.

Ash Disposal Considerations

The discussion of ash disposal in the draft EIS tends to understate the problems inherent in the disposal of ash from the combustion of municipal solid waste and refuse-derived fuel. While these problems would not necessarily jeopardize the implementation of the project, it is essential that the discussion in the EIS be complete. Leach test results of fly ash have in fact frequently shown levels of Pb and Cd sufficiently high to categorize the sample as hazardous. Levels of these metals in bottom ash are also elevated, though not as high as in fly ash. While it appears that the high pH of the ash may tend to stabilize these metals, it does not necessarily follow that the ash may be deposited with mixed municipal waste. Separate disposal areas for ash are a likely requirement. This should be stated in the EIS. Positive attributes of RDF are the elimination of variability in the waste, which

Phone: 296-7799

1935 West County Road B2, Roseville, Minnesota 55113-2785

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Ms. Sandra Gardebring
Page Two
May 1, 1985

allows for more efficient combustion. Consequently, organics are not expected to be a problem in the ash. The discussion of ash disposal should include a presentation of test results, including those from the study cited in the EIS, and data available from other sources. Please contact Ken Podpeskar of our Division of Solid and Hazardous Waste for additional data (297-1786).

The staff also has concerns regarding the discussion, in the EIS, of ash disposal sites. Capacity for ash disposal in landfill sites in the immediate area of the Red Wing combustion facility are likely to be exhausted by ash disposal requirements of that facility. The Red Wing sanitary landfill has remaining capacity of 1.5 to 2 years in the demolition debris area and approximately 29,000 cubic yards of remaining capacity (5 years at present fill rates) in the mixed municipal solid waste area. The RDF combustion facility is expected to produce 30,000 cubic yards of bottom ash per year. If ash is routed to the Pine Bend landfill, it will likely require deposit in a separate area of the landfill. In short, a suitable long-term disposal facility for combustion residuals has yet to be identified. A new or expanded land disposal facility will be required for Goodhue County or the ash will have to be deposited in a landfill located some distance from the combustion facility. If an ash-only landfill is proposed, it will likely be subject to design standards similar to those required for a mixed municipal landfill. The above information should be included in the final EIS.

Co-composting of the Heavy Fraction

In a letter to Warren Schaber, Chairman, Ramsey County Board of Commissioners, dated April 4, 1985, our staff has already recommended that the RDF proposal be expanded to include co-composting of the heavy fraction, which is normally landfilled. A copy of that letter was addressed to you. An RDF facility, in combination with heavy fraction co-composting, could reduce landfilling requirements from 30 percent to between five and ten percent of the arriving waste. Facilities relying upon co-composting or RDF production alone cannot accomplish this reduction. The final EIS should include a discussion of the economics of heavy fraction co-composting, based upon information from similar operating systems in this country (specifically, Wilmington, Delaware). The impact of RDF/heavy fraction co-composting on the need for land disposal capacity for at least a ten-year period should also be addressed. We strongly recommend that the final EIS include this option, even if it is not anticipated that co-composting will be immediately included as part of the project.

Recommended Revisions to the Discussion of the Co-composting Alternative

The staff believes certain revisions to the evaluation of co-composting would be appropriate. The capital cost estimates on page 16 for co-composting appear to be excessive on the high end of the range. Two vendors with local offices were contacted, and indicated that they could provide a deluxe version of their facility with a capacity of 2000 tons/day for \$50 million. Further, the executive summary states that co-composting is still considered experimental (page iv). On page 19 of the EIS, it is stated that "co-composting alternatives are not believed to be developed to a sufficient degree to warrant serious consideration..." We note that there are 200 operating co-composting facilities in Europe, and MPCA and Metro Council staff who have toured co-composting facilities in Europe and the United States have found them to be as free of nuisance conditions at comparably-sized incinerators. Our own estimates suggest that co-composting facilities are considerably less expensive than other alternatives. In short, the co-composting alternative cannot be dismissed on the basis of the information provided in the draft EIS.

Errata

The following corrections should be made to the final EIS, either in a rewrite of the draft EIS or as errata. Contact persons are provided in parentheses should you have specific questions about the errata or the permit question.

1. On page 90, in line 1, the phrase "ash retention or" should be deleted.
2. On page 90, in lines 4 and 5, the phrase "specified in the permit" should be deleted and replaced with "estimated" (contact Bernard Gallagher, 296-7712).
3. In Table 4, a State Certification of the 404 permit will also be required from the MPCA, under authority of Section 401 of the Clean Water Act (contact Louis Flynn, 296-7355).
4. Also in Table 4, the Solid Waste Facility permit from the MPCA, Division of Solid & Hazardous Waste, will probably be issued separately, as the air emission facility installation and operating permit appears not to be required (contact Don Kyser, 296-7273).
5. Also in Table 4, an industrial waste co-disposal certification should be added to the permits required by the MPCA (contact Lisa Thorvig, 297-1781).

Ms. Sandra Gardebring
Page Four
May 1, 1985

Thank you for the opportunity to review the draft EIS. As questions arise, please have your staff contact the appropriate individuals cited above or Deborah R. Pile, Director, Office of Planning and Review, at 296-7799.

Sincerely,

A handwritten signature in dark ink, appearing to read "Tom Kalitowski", written in a cursive style.

Thomas J. Kalitowski
Executive Director

TJK/jw

cc: Wayne Nelson/Karen Harrington, Metropolitan Council
Lynne Bly, Metropolitan Council
Mary Richardson, Ramsey County

Minnesota Pollution Control Agency

The discussion in the "Regulation Of Combustion Effects" chapter of the disposal of ash from RDF incineration could more completely describe the inherent problems. The text of the DEIS has been expanded to more thoroughly explore these problems and the regulatory structure for addressing them. The text has also been expanded to identify the landfill capacity implications of the ash disposal problem.

The Council concurs with the MPCA recommendation that the RDF proposal be expanded to include co-composting of the heavy residue fraction that would initially be landfilled. While the EIS is not a forum for recommendations, additional text has been added to the "Project Size" analysis to address the potential for incorporating co-composting strategies.

A variety of national and local efforts to explore co-compost market development issues have been completed or are underway. Locally these studies include research by E & A Environmental Consultants, Inc. completed in 1983 for the Metropolitan Waste Control Commission, a feasibility study of large-scale co-composting completed by the Metropolitan Council in 1984, and a University of Minnesota project now getting underway to engage in market development for compost products. The MWCC study strongly supports the need for a full-scale demonstration project. Economies of scale for co-compost operations are such that a small-scale pilot project would involve capital and marketing costs nearly as high as necessary for an ongoing effort.

The data on capital cost estimates for co-composting cover a wide range because of the limited experience with such operations in the U.S. and the broad range of design alternatives employed in Europe. The cost range is not invalidated by the estimate of local vendors that a deluxe facility of twice the comparison facility size could be constructed for the \$50 million figure that is the high end of the range. Variations in intended markets for the compost product and potential site location factors require a broad range.

The MPCA takes issue with the references in the DEIS that co-composting is still considered to be experimental in the U.S. This assessment is based on the fact that the Council's EIS technical consultant could identify only two operational co-compost plants in the U.S. Extensive use of co-composting in Europe was identified. The technology itself is not experimental, but rather its use in the U.S. is developmental in the context of proven markets for compost products, familiarity or widespread application. The consultant analysis found co-composting to compare favorably with other technologies in terms of cost, reliability, availability and environmental impacts. Despite the practical nature of this alternative, the references to co-composting as being experimental (developmental) in the U.S. appear to be warranted.

The "errata" suggestions have been incorporated as revisions to the DEIS text with one exception. No change was needed to indicate that an air emission facility installation and operating permit appears not to be required. The DEIS indicated in the comment column of Table 4 that this might be the case. The very low level of emissions expected at the Newport waste processing facility have led MPCA staff to the conclusion that these emissions will be controlled by rule instead of the issuance of a permit.



STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

BOX 10 , 500 LAFAYETTE ROAD • ST. PAUL, MINNESOTA • 55146

DNR INFORMATION
(612) 296-6157

April 30, 1985

Mr. Wayne Nelson
Metropolitan Council
300 Metro Square Building
St. Paul, Minnesota 55101

RE: Ramsey/Washington Waste-to-Energy Project
Draft Environmental Impact Statement (DEIS)

Dear Mr. Nelson:

The Department of Natural Resources (DNR) has reviewed the above-referenced document and we offer the following comments for your consideration.

As described in the DEIS and confirmed by a field inspection conducted by DNR staff, the proposed site for the facility provides a high-value mix of floodplain forest, grassland, and wetland habitat types. The DEIS indicates that this natural habitat and the wildlife resources that it supports will be significantly impacted by the proposed project. What is lacking in the DEIS is an evaluation of the wildlife resource impacts that would be expected with development of the various project alternatives, particularly the site to the north of the proposed site. Without an evaluation of the environmental impacts of the alternatives, the DEIS does not provide an adequate aid to decision-making.

The mitigation component of the habitat impacts section is not specific enough in describing what will be done to mitigate the loss of habitat. The responsibility for implementation of mitigative measures should be specified in the document. We recommend that a 200-foot wide buffer area of natural vegetation be retained along the western boundary of the site. The possibility of reorienting the facility on the site to avoid wetland filling is presented, but the relative impacts of the two development schemes are not described. If additional wetland areas will be constructed as part of the mitigation plan, then the size, location, and type of these areas should be identified.

The discussion of erosion impacts and mitigation on pages 70 and 71 seems to miss the fact that the facility will be constructed on fill and that there will be no natural vegetation to stabilize this fill during construction. Therefore, staged development as a mitigative measure would not be effective at minimizing erosion unless the fill could also be delivered in stages. We are concerned

Mr. Wayne Nelson
Page 2
April 30, 1985

that erosion of fill material during the initial stages of site preparation could cause significant sedimentation of wetlands and other habitat areas that are not supposed to be altered. Impacts and limited mitigation measures for controlling fill erosion are minimally addressed on page 66. However, the EIS should describe what methods will be applied to prevent erosion of the fill material into nearby wetland areas. The measures described on page 66 do not appear to be adequate in this regard. It would appear that a temporary sedimentation basin is needed during the construction phase to control runoff water. Other erosion control methods, such as filter fabric and hay bale dam installation, may be necessary.

In listing the permit/approval requirements in Table 4, the DEIS indicates that a DNR water appropriation permit may be required. The EIS does not provide information on estimated withdrawal volumes for a commercial well, nor are the location and extent of construction below the groundwater table indicated.

Thank you for the opportunity to review this project.

Sincerely,



Thomas W. Balcom
Environmental Review Coordinator

pje 415
c: Kathleen Wallace
Ron Harnack
Earl Huber
Gregg Downing - EQB
Douglas Wood - Washington County

Minnesota Dept. of Natural Resources

Additional text comparing the potential impacts on wildlife resources at the two sites has been added to the EIS.

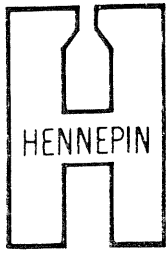
The EIS is an informational document, and as such, cannot require detailed, specific mitigative measures to be undertaken or specify which parties must be responsible for undertaking specific mitigative measures. The EIS can identify potential problems and suggest measures to prevent or minimize them. Each permitting agency can then use the EIS as one tool in deciding, based on its authority, what specific measures to require. The EIS can also suggest that the project proposers cooperate with interested agencies in developing the site. Text has been added to the EIS concerning cooperation between the proposers and the DNR.

The proposed site layout as well as the alternative site layout presented in the DEIS would leave over 200 feet of land between the river and the facility buildings.

The primary purpose of the alternative site layout suggested in the EIS is to mitigate impacts on existing on-site wetlands; the EIS notes this on page 75. Page 71 suggests that at least 9 acre-feet of wetland storage capacity be incorporated into the site.

Page 75 of the DEIS suggests the development of a settling basin. The DNR's suggestions for additional mitigative measures have been added.

Page 46 of the DEIS states that the well will be capable of withdrawing 300 gpm. Text has been added indicating the diameter, depth, and average usage rate of the well.



DEPARTMENT OF ENVIRONMENT AND ENERGY
A-1603 Government Center
Minneapolis, Minnesota 55487-0163



612-348-6846

May 1, 1985

Lynne Bly
Metropolitan Council
300 Metro Square Bldg.
7th & Robert Sts.
St. Paul, MN 55101

Dear Lynne:

Attached are a number of comments on the draft Environmental Impact Statement on the Washington/Ramsey County RDF facility.

We offer these comments to clarify some of the statements made in the EIS concerning the relationship of mass burn and RDF plants, costs and other impacts addressed. We further believe that if these suggested changes could be made, it would greatly facilitate the preparation of future Environmental Impact Statements on solid waste resource-recovery facilities proposed in the metropolitan area.

I believe the comments offered are self-explanatory. However, please do not hesitate to contact me if there are any questions.

Sincerely,

Luther D. Nelson, P.E.
Director

LDN:mvr
Attachment
BLY

HENNEPIN COUNTY

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REVIEW OF MARCH, 1985 DRAFT
ENVIRONMENTAL IMPACT STATEMENT
FOR
RAMSEY/WASHINGTON WASTE-TO-ENERGY PROJECT

Prepared By
The Metropolitan Council of the Twin Cities Area

We feel there are two basic problems with the document as presented in draft form. The first problem is that the document, in itself, is really an incomplete evaluation of the Ramsey/Washington County project. Overall, there is very little supporting data provided and several issues are only superficially addressed.

The second item we would take issue with is the continuing comparison of RDF versus mass burn as a basis for decisions in the EIS. An EIS should be an evaluation of the impacts of the proposed project rather than a comparison of technologies. Further, statements made in these technology comparisons are often misleading.

Specific areas of comment are as follows:

- Page 12 Use of the term "incinerator" is misleading. None of the resource recovery alternatives considered in the document (modular, mass burn, RDF, or pyrolysis) are "incinerators". A Section should be included to define all terms applicable to resource recovery activities.
- Page iv Third paragraph under "Alternatives to the Project", last sentence. Comparing problems of a mass burn system to a modular system is inappropriate. The technologies are too dissimilar to make this type of a statement.
- Page 5 Figure 3. This figure could be misleading. Perhaps the tons per year could be added to the percentages shown on the descending arrows.
- Page 16 Operating Cost, first sentence. We believe it would be difficult to document the first sentence which indicates that the operating cost of an RDF facility including boiler facilities would be lower than a mass burn facility. This statement is not supported by facts. RDF processing is generally more labor and energy-intensive; therefore, operating costs for RDF facilities are higher than for comparably sized mass burn facilities. The capital costs from an RDF facility may be less if an existing boiler is available which does not require extensive renovation.
- Page 17 Environmental Concerns. We feel that the environmental concerns identified for mass burn should be identified as concerns for all of the technologies identified. A general discussion of Resource Recovery Environmental issues should be included in the EIS.
- Page 17 Thermal Efficiency. Again, we have a comparison of technologies which may be inappropriate. The fact that RDF plants utilize more energy to produce the RDF has not been considered. The point is, if comparisons are to be made, they should be complete and accurate. The comparisons made in this draft EIS between RDF and mass-burn facilities are incomplete and inaccurate. If the comparison is done, at least the efficiencies, volume reductions, etc., should be included for RDF.

- Page 17 Environmental Concerns, second paragraph. The first sentence is another comparison which is not supported by facts. Air emissions from RDF-fired boilers are not "less objectionable" than those of mass burn-fired boilers. Each process has some unique emissions characteristics, but neither is clearly superior to the other. Reference to the data presented in the California Air Resource Board report entitled, "Air Pollution Aspects of Resource Recovery" March 17, 1980 would be helpful to completing any technology comparison. (See attached data sheets).
- Page 17 Again, there are misleading comparisons as to combustion control methods. Field erected mass burn boilers include systems and control for fuel and air metering. Modular systems vary in the methods of control but also are controlled combustion systems. A complete description of each technology should be included to clearly describe each alternative.
- Page 17 Environmental Concerns, second paragraph. The issue of explosions has been primarily a problem only at RDF facilities. Explosions have occurred with RDF facilities rather than "have been associated with RDF facilities". Reference to the Akron, Ohio RDF facility and remedial measures should be included.
- Page 18 Characteristics/Advantages of RDF technology should be in terms of the process which will actually be used at the Newport facility.
- Page 18 Selection of RDF, paragraph three, first sentence. The statement is true, but seems to be out of place. If they are discussing the removal of paper and plastics during RDF processing, we feel that the statement is untrue.
- Page 18 Selection of RDF, paragraph four. Again, the third sentence is an unnecessary comparison which does not, in itself, lead one to a conclusion. Thermal efficiency is only part of the issue and does not consider higher electric use at the RDF facility and a number of other factors. We would suggest eliminating the sentence. The next to the last sentence of the paragraph again seems to be an unnecessary comparison.
- Page 19 The first three sentences of this section (conclusion) need revision, due to ambiguity and inaccuracy.

The primary factor affecting the counties' decision to implement RDF technology was the lower capital costs, not "several inherent" disadvantages" of mass burn facilities. There is great significance attributed to the "flexibility" of RDF. The only use of the RDF which has any factual basis is combustion of the RDF. No other uses are proposed for the RDF and, since the purpose of an EIS is to present facts, treating speculative uses as a basis for decisions does not seem appropriate. The third sentence is not supported by any facts. Sizing of resource-recovery facilities involves many factors which are equally important, whether the facility is an RDF or mass burn facility.

The frequent use of subjective and conclusory statements in the EIS which are not supported by factual data seems unnecessary and inappropriate since the purpose of an EIS is to present facts, not make subjective judgments.

Page 38 Transportation. What happens to traffic flow when I-494 ramps are being rebuilt in the 1990's?

Page 42 Unacceptable Waste. It would be very difficult to inspect packer truck at the scale house to deny it entry. A more defined procedure should be established to inspect for unacceptable waste from a packer truck. A floor spotter/inspector type position would provide the necessary inspection.

Page 44 Mitigation Measures. This section states that procedures could be not "will be" negotiated with counties regarding hazardous waste. Since contracts have been executed and design begun, mitigation analysis should state what will or will not actually be done.

Page 45 Use of pits in resource-recovery plants does not correspond to "early designs". There has been a trend away from receiving pits for RDF facilities due to the greater need to sort waste at such facilities to identify potentially explosive materials.

Page 45 Sixth paragraph. They probably mean radio communication to the front end loader and hard wire communication to the control room.

Page 64 Paragraph 6: Why is it necessary to store diesel fuel below ground? Have above-ground storage alternatives been considered? The potential for groundwater and surface water contamination from a buried fuel tank is significant.

The EIS should address the specific measures that will be taken to eliminate or reduce the potential for contamination.

Page 71 "Mitigation Measures": The EIS does not discuss any specific measures which will be implemented to eliminate or reduce surface water impacts. Several possibilities which "could" be used are superficially suggested. Specific design alternatives should be discussed.

Page 75 Mitigation Measures. Beginning of this section states that "preservation of wetland habitat should be a priority". Yet, there are no specific procedures outlined that will be incorporated to preserve the wetlands.

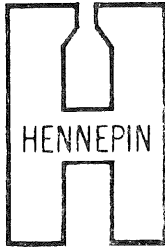
Page 89 Regulation of Combustion Effects, paragraph one, second sentence. The resultant ash is a product of the processing/combustion process. Reasons given for closure at Milwaukee and Monroe Co and others was often higher than anticipated ash content fusion on grates etc.

Page 77-79 The "project" described in the EIS appears limited to the RDF
and 89-90 processing facility in Newport. However, at various points in
Generally the document, air quality impacts of combustion are discussed
and comparisons made between RDF combustion and mass burn

combustion. There are many conclusory statements made that RDF combustion results in "less objectionable" or environmentally preferable air-quality impacts when compared with mass burn facility impacts. Such statements should be supported by the facts on which they are presumably based, and those facts should be set out in the document. If the Council does not have the facts necessary to support such conclusions then those statements should not be made. Hennepin County is familiar with these issues and is not aware of data which clearly demonstrate the asserted differences in emissions impacts. The County is concerned that such unsupported conclusions may adversely affect Hennepin County resource-recovery-implementation efforts. If facts exist which clearly support these statements, then these facts should be in the draft EIS.

- Page 89 Regulation of Combustion Effects, paragraph two. The term "incinerators" is again used in a misleading manner. The report needs to clearly define resource recovery techniques and technologies.
- Page 89 Air Emissions, second paragraph. It is difficult to understand how an MPCA permit analysis resulted in the comparison of two separate types of technologies. The fact that the permit has been issued should be sufficient for this evaluation. Beyond that, the lack of information and data provided in the EIS makes much of this discussion subjective. Further, it is unlikely that the MPCA made a statement that the air emissions are acceptable. There are no ambient standards nor emission limitations for most of the trace elements in acid gases produced by RDF combustion. If this type of conclusion appears in the DEIS, then a section supporting the conclusion, including data should be included. The permit requires additional data and analysis of these emissions, therefore the process is not complete.
- Page 90 Conclusion 2 - is the term "municipal incinerator" supposed to apply directly to some form of mass burn technology? If so, the comment is unsupportable. It is unlikely that the MPCA made any comparative analysis between technologies since permits are only based on data submitted by the applicant for a specific facility.

Definitions are not present in the DEIS and this omission contributes to a less-than-clear understanding of what technology NSP is proposing and what its merits are. For example, RDF processing facilities referred to in the DEIS have typically provided RDF fuel to be co-combusted at a mix of 20% RDF-80% coal. Is the Red Wing facility typical or not?



DEPARTMENT OF ENVIRONMENT AND ENERGY
A-1603 Government Center
Minneapolis, Minnesota 55487-0163



612-348-6846

May 2, 1985

Lynne Bly
Metropolitan Council
300 Metro Square Bldg.
7th & Robert Sts.
St. Paul, MN 55101

Dear Lynne:

My comments on the draft EIS on Washington/Ramsey
County RDF facility referred to some attached
data sheets. They were inadvertently left out,
and are enclosed with this letter.

Sincerely,

Luther D. Nelson, P.E.
Director

LDN:mvr
Enclosure

HENNEPIN COUNTY

an equal opportunity employer

State of California

AIR RESOURCES BOARD

AIR POLLUTION ASPECTS
OF
RESOURCE RECOVERY FACILITIES

Prepared by:

George Simons

Reviewed by:

Ray Tuvell, Manager
Energy Project Evaluation Section

Ronald A. Friesen, Chief
Project Evaluation Branch

March 17, 1980

Final Report

(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.)

Cover: The flow diagram shown is a modification of a flow scheme developed by Glaus, Pyle, Schomer, Burns and Dehaven for the Akron, Ohio Facility.

VI. AIR POLLUTION EMISSIONS FROM RESOURCE RECOVERY FACILITIES

A. MASS BURNING AND RDF-FIRED FACILITIES

1. Mass Burning Facilities

The earliest municipal incinerators were mass burning facilities designed primarily to reduce, by incineration, the volume of waste to be transported to nearby landfills for disposal.³ The most common of these municipal incinerators were the refractory lined type. The furnace walls of the facilities were composed of materials that re-radiated the heat to the fuel bed. This insured complete combustion of the waste without requiring the use of auxillary fuels. Temperature levels were controlled in the furnace chamber by the use of air in excess of that theoretically required for combustion. The use of high volumes of air to control the furnace temperature led in turn to the requirement of large refractory combustion chambers.

In contrast to refractory lined facilities, waterwall facilities utilize furnace walls composed of closely spaced steel tubes welded together that contain water or steam. The water or steam circulating throughout the piping network extract the waste heat generated from the ongoing combustion process and can be used for controlling the heat rate at the furnace walls. The introduction of water tubes into

incinerator chambers is responsible for the following three differences between refractory lined and waterwall facilities.

In general:

- a) Waterwall furnace chambers are smaller than refractory lined furnace chambers.
- b) Waterwall facilities require less excess air than refractory lined furnace chambers.
- c) Combustion temperatures are higher in waterwall furnace chambers than in refractory lined furnace chambers.

Historically, waste heat recovery from refractory lined mass burning facilities appeared to be limited to the production of low quality steam (low temperature and pressure). The desire to produce high quality steam, while simultaneously obtaining the advantage of reduced excess air levels (hence reduced volumes of flue gas to be treated for air pollution) resulted in the construction of many waterwall mass burning facilities in Europe after 1950. There now appears to be a move toward utilizing partial waterwall and refractory coated waterwall combustion chambers in Western Europe rather than installing waterwall tubing completely down the walls in the combustion chamber.⁴ In anticipation of a trend toward increased usage of refractory linings, emission estimates for refractory lined mass burning facilities have been included in this report.

2. RDF-Fired Facilities

There are usually two reasons for processing municipal solid waste (MSW) into a refused derived fuel (RDF). First, recovery of metals prior to combustion insures the metals will not become contaminated with glass or sand during the combustion process. The result is a higher quality metal product for sale on the market. Second, removal of the non-combustible portion and shredding of the MSW to a uniform size theoretically produces a solid waste suitable for combustion in a steam boiler.

The front end processes that refine MSW into RDF include manually removing the large non-combustible items (e.g., refrigerators), shredding of the MSW into small, uniform pieces, and air classifying the shredded MSW into a light combustible portion and a heavier non-combustible portion. The non-combustible fraction is further treated to remove ferrous metals, non-ferrous metals and glass, and the residue is sent for disposal at a landfill. The combustible portion is RDF, a semi-dry product with a heating value approximately a factor of one and a half higher than the average heating value of MSW. RDF has a higher heating value than MSW due to two items: paper products and plastics. Both paper products and plastics have higher heating values than any of the other components making up MSW.*

Consequently, the air classification process involved in the production of RDF from MSW is essentially just a method for

* See Table 37 on page 109

concentrating the paper and plastics contained in MSW. As the report will show, the paper and plastics portion of MSW contains high concentrations of chlorine, sulfur, and trace elements, such as lead, cadmium, tin, zinc, antimony and mercury. RDF, which is essentially a concentrated form of the paper and plastics portion of MSW, has a higher concentration of chlorine, sulfur and trace elements than MSW. The difference in the concentrations of sulfur, chlorine and trace elements between RDF and MSW is often greater than the difference in the heating value of the two fuels. Consequently, the emissions of sulfur, chlorine and certain trace elements are higher from RDF than MSW. In addition, several of the trace elements (e.g. selenium, cadmium, arsenic and lead) are known to exhibit synergistic toxic effects when emitted together in significant quantities. The following sections summarize the emissions associated with mass burning and RDF-fired facilities, and indicate Best Available Control Technology guidelines.

3. Measured Emissions and Calculated Emission Factors

Tables 5 and 6 are listings of the measured emissions (corrected to a 12 percent carbon dioxide concentration) for mass burning and RDF-fired spreader stoker facilities.

Emission factors for mass burning and RDF-fired spreader stoker facilities are contained in Tables 7 and 8. The methods and data used to develop the values listed in Tables 5 through 8 are contained in Appendix A.

TABLE 5
MEASURED EMISSIONS AT RESOURCE RECOVERY FACILITIES

Type of Facility	Range	Uncontrolled Emissions(corrected to 12% CO ₂)					
		NO _x (ppmv)	SO ₂ (ppmv)	TSP (gr/dscf)	CO (ppmv)	THC (ppmv)	HCL (ppmv)
Mass Burning Waterwall	Low	74	12	0.83	105	7.3	76
	High	262	442	2.05	2186	60	326
PDF-fired* spreader stoker	Low	79	162	3.25	198 ⁺	8	610 ⁺
	High	427	472	3.52	1160 ⁺	2450	654 ⁺
RDF-fired** spreader stoker	Low	79	162	1.08	198 ⁺	8	291
	High	427	472	3.52	1160 ⁺	88	654

*Without East Hamilton data.

**Includes East Hamilton data.

⁺Reflects Hempstead data only.

⁺Reflects Hagerstown data only.

Further data on incinerators at East Hamilton, Hempstead and Hagerstown can be found in Section VIII and Appendix A.

TABLE 6

-30-

+ All emissions corrected to 12% CO₂+ All emissions corrected to 12% CO₂

* Includes East Hamilton data

TABLE 7

SW-10, 10/10/10 074/1.4

12 noon 000 RT 6/1

TABLE 7
ESTIMATED EMISSION RATES FOR RESOURCE RECOVERY FACILITIES
UNCONTROLLED EMISSIONS

Type of Facility	Range	Emission Rates (lb of pollutant/10 ⁶ Btu of fuel fired)					
		NOx	SO ₂	TSP +	CO ++	THC +++	HCL #
Mass burning Waterwall	Low	0.07 .7	0.04 .4	1.27 12.7	0.15 1.5	0.003 .3	0.14 1.4
	High	0.42 4.2	0.72 7.2	7.32 73.2	2.00 20.0	0.004 .4	1.96 19.6
RDF - fired* spreader stoker	Low	0.20 2.0	0.30 3.0	3.0 30	0.45 4.5	0.02 .2	0.37 3.7
	High	0.63 6.3	1.8 18	3.7 37	2.33 23.3	1.1 11	0.45 4.5
RDF - fired** spreader stoker	Low	0.02	0.30	3.0	0.45	0.02	0.37
	High	0.63	1.8	7.4	2.33	1.1	0.45

* Without East Hamilton data

** Includes East Hamilton data

+ TSP valued do not include the Hempstead data (RDF-fired facilities)

++ CO data for Hempstead only (RDF -fired facilities)

HCL Data based only Hagerstown data (RDF - fired facilities)

+++ Total hydrocarbons as methane. (Hempstead data not cited)

TAP 8
TRACE ELEMENT EMISSION FACTORS FOR RESOURCE RECOVERY FACILITIES
UNCONTROLLED EMISSIONS

Type of Facility	Range	Emission Factors (grains of pollutants/10 ⁶ Btu of fuel)									
		Pb	Hg	Cd	Zn*	Sb	Fe	Cu	Ni	As	Cr
Mass Burning	Low	105	2.3	0.5	91	2.6	4.0	4.1	NA	0.53	NA
	High	154	66	9.4	350	7.1	57	29	2.3	0.66	5.4
RDF Fired	Low	.51	0.22	1.5	0.03	0.3	1.85	1.40	0.17	0.1	0.54
	High	88	4.1	15	12	0.8	13	8	7	6.8	7
Multiple + Hearth Furnace	Low	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	High	17.5	2.3	1.2	NA	NA	NA	NA	NA	NA	NA

NA = not available

+ Emission data from Contra Costa tests; reference 80.

* The values in this column represent emissions of Sn for RDF-Fired Facilities

Hennepin County

Documentation is provided where appropriate throughout the document and a general comparison of alternative technologies is required based upon the scoping decision document for the EIS. The technological comparison contains enough information for readers to evaluate whether the selected approach is reasonable with respect to feasible alternatives. These alternatives are explored in a comprehensive but summary fashion so most readers can conveniently evaluate the reasonableness of the proposed resource recovery alternative in terms of costs and environmental impacts. Resource recovery facility developments in somewhat different geographical, energy market or waste volume contexts will require variations in the information about alternatives to contain the level of detail necessary to support a preferred alternative in such circumstances.

The reference to "incinerator" on page 12 refers to the combustion component of a mass burn facility and is not a general description of a mass burn facility operation. Mass burn projects clearly encompass a wide range of waste-to-energy aspects that go beyond incineration aspects, but the combustion component may be referred to as an "incinerator." Use of such terms in "plain and objective language" is required in an EIS and a glossary is not necessary. The Council's Solid Waste Management Plan does contain a glossary although the word "incinerator" is not included in it.

The generalization in the Executive Summary about problems experienced at modular combustion plants being similar to those experienced at larger mass burn facilities seems warranted in an introduction. Both types of facilities, when publicly implemented, typically receive part or all of their waste supplies from residential or commercial haulers, provide little sorting or processing, burn the material, and dispose of ash.

The suggestion for additional data to show tonnages indicated by the percentages in Figure 3 on the waste stream is good although the additional data might obscure the basic message about the distribution of waste flows. All the percentages relate to the total waste estimate so tonnages can be easily calculated.

The initial operating cost projection, including debt service expense, for an RDF facility with existing boilers will be less than for a similarly sized mass burn facility because the smaller amount required to amortize the capital investment more than offsets the higher labor and energy costs referred to by Hennepin County. This conclusion was also reached by Henningson, Durham and Richardson (HDR), the consultant firm used in the preparation of the Ramsey/Washington Joint Designation Plan. Hennepin County is correct that capital costs for an RDF facility may be less if an existing boiler is available which does not require extensive renovation. The boiler is not part of this proposed project though and analysis of hypothetical boiler renovation costs was not within the scope of this EIS.

The discussion of "Environmental Concerns" on page 17 is intended to identify possible distinctions between the effects of different technologies. The concerns mentioned for mass burn facilities are addressed where they apply to the alternative technologies. A more general discussion of resource recovery environmental issues would go beyond the scope of this EIS.

The "Thermal Efficiency" comparison on page 17 clearly addresses only waste volume reduction and heating values from combusted materials. Repetition of

information about related costs such as those for RDF production would be unnecessarily confusing. This discussion is general to portray practical differences in technologies. The major trade-offs between mass burn and RDF technologies here deal with the facts that mass burn plants typically combust a higher proportion of the waste stream while RDF fuel has a higher BTU content for the fraction that is actually burned. Additional text has been added to the EIS discussion on "Operating Cost" to identify higher staff and electricity operating costs associated with RDF processing projects.

The statement that most air emissions from RDF-fired boilers are generally believed to be less objectionable than those of mass burn-fired boilers is challenged. This professional judgement of the Council's EIS consultant is based upon a theoretical understanding explained in the text. MPCA staff reached a similar conclusion in connection with the air emission permit for combusting RDF at the NSP Red Wing facility. The scope of this EIS does not warrant more detail on this subject than is provided in the Regulation of Combustion Effects Chapter because the combustion facility is not a part of this project.

The statement about the complementary relationship between combustion efficiency and the concentration of organic materials of uniform size through processing does not imply that systems to control fuel and air metering in mass burn boilers are inadequate. The fact that explosions have occurred at RDF facilities is not glossed over and is dealt with explicitly in the section of the EIS entitled, "Fire and Explosion."

The discussion on "Selection of RDF": on page 18 is appropriately general because of the potential to respond to future market and technology changes that may, for example, allow the cost-effective recovery of paper and plastics. Thermal efficiency is only a part of the issue of technology selection, but a reference to this analysis is desirable because thermal efficiency has a bearing on the long-term interest of the energy user.

The "Conclusion" on page 19 points out "several inherent disadvantages" for Ramsey and Washington Counties. The text of the DEIS has been expanded to identify that the disadvantages apply to Ramsey and Washington Counties and the misleading term "inherent" has been removed. Lower initial capital costs and flexibility to sell all the RDF to NSP or store it and use it in alternative ways like co-composting are legitimate concerns of the counties. The counties' concerted effort to size a mass burn facility to meet 3M's energy needs is documented in the EIS and the size contemplated would have resulted in less landfill abatement than the proposed resource recovery facility. The point of the "Conclusion" on page 19 is to summarize the technological considerations emphasized by the counties in selecting the RDF technology. Judgements that are subjective to the Ramsey/Washington County situation may not be generalizable to other situations.

Traffic flow while I-494 ramps are being reconstructed in the 1990's has not been analyzed. Traffic associated with the facility represents a small portion of vehicle volumes on the ramps and it is assumed that suitable arrangements will be made despite the current limitation of a single access road.

Inspection for unacceptable waste (page 42) will depend in part on cooperation with haulers. Inspection will also occur on the tipping floor along with appropriate collection and disposal procedures. This general topic is addressed with additional text in response to comments submitted by Michael

Hines.

Mitigation measures reflect options that should be considered by the various government bodies and citizens that may contribute to the approvals process for the project. The text on this subject has been expanded in response to comments submitted by John Sauers. It is premature to state how hazardous wastes will be handled since the counties have retained financial responsibility for hazardous waste disposal costs and the procedures to be followed will be governed by statutory changes and permit requirements.

The contract between the counties and NSP has not yet been approved by the Metropolitan Council; opportunity still exists to require modifications to the contract. Furthermore, the EIS itself cannot require specific mitigative measures to be undertaken, it can only suggest them. The permitting agencies then use their discretion in deciding what measures to require.

The note for page 45 about radio communication between the grapple cab, front end loader and the control room is correct and a change in the DEIS text eliminates the inaccuracy.

Conversations with staff of the State Fire Marshall's office indicate that an above ground tank would not be approvable because of the fire and explosion risk it would present. Again, the EIS cannot require specific mitigative measures.

See comment above regarding the role of the mitigative measures in the EIS. Specific design alternatives to minimize surface water impacts will be discussed during the permitting process.

Specific procedures to mitigate wetland impacts will also be outlined during the permitting process, if the permitting agencies deem them necessary. The EIS suggests that alternative site layouts, selective management of on-site wetlands, and construction of new wetlands be considered during permitting.

Hennepin County correctly notes that the "project" described in the EIS is limited to the facility operation proposed for Newport. There are points identified in the EIS scoping document, however, requiring additional analysis or description. Analysis of technological alternatives and a description of the regulation of combustion effects were required. The "conclusionary statements" about RDF and mass burn combustion results on page 89 that the County takes issue with are taken from the MPCA 1984 air emissions facility permit and related staff analysis. This document is available to the public and a summary of these conclusions is germane to the EIS for this project.

The reference to municipal incinerators on page 90 does refer to mass burn technology and reflects a conclusion of the MPCA. This conclusion may encompass perceptions of the environmental and economic advantages of the recovery and reuse of both materials and energy. Disadvantages are adequately documented in other parts of the EIS.

The final comment is about NSP's plan to burn RDF without the addition of coal as is typical of many RDF combustion operations. This information has no significant bearing on environmental impacts of the proposed waste processing plant at Newport.

earth protector^{T.M.}

Wayne Nelson
Metropolitan Council
300 Metro Building
St. Paul, MN 55101

May 2, 1985

RE: Draft EIS for the Ramsey/Washington RDF Facility

Dear Wayne:

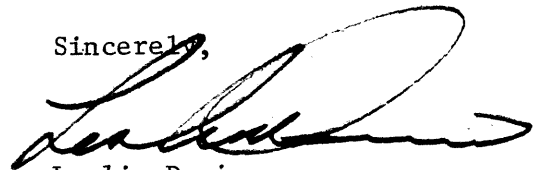
Before commenting fully on the DEIS I would like two questions answered and I hope getting this letter in on time it reserves my right to comment further next week.

1. What is the market for the RDF material if NSP is denied the permits to burn this material at their Red Wing and Mankato facilities due to improper pollution control equipment at these plants?

2. Since a substantive change has taken place in the total waste management plan with the mandatory recycling issue and there is the possibility of a new hearing on the plan, how will this affect the RDF project? Would you approve the plans for a facility without a plan in place?

Yours For A Cleaner Earth

Sincerely,



Leslie Davis
President

Earth Protector

NSP has a permit to burn RDF at its Red Wing plant. If combustion of RDF is prohibited in the future, other options would have to be explored including landfill disposal on an emergency basis, co-composting, and delivery to waste processing facilities in other counties. If recycling becomes mandatory in the future, the Council projects that sufficient municipal solid waste will continue to be generated in Ramsey and Washington Counties to operate the proposed facility at capacity. If Council goals for source separation could be substantially exceeded, it would be fortuitous if wastes from outside the counties could be diverted from landfills to the proposed facility.

Michael C Hinz
4264 Woodlane Dr
Woodbury MN 55125

May 3, 1985

Wayne Nelson
Environmental Planner
Metropolitan Council
300 Metro Square Building
St Paul MN 55101

Dear Mr Nelson:

I felt that it was important to follow up on the comments that I made at the Public Hearing April 23 because of the article in the newspaper this past week. I feel that the article was misleading and, more importantly, the planner who was quoted did not fully understand what I was saying.

I asked that the Metropolitan Council put a limit on the number of trucks that may be in a waiting line at the facility at any given point in time. I would further suggest that the maximum number of trucks be 30. The planner quoted in the paper suggested that this is a County, NSP, and Hauler problem and has no effect on the EIS. I suggest to you that this has far reaching effects from air quality in Newport to uncollected refuse on the streets causing a health hazard.

The Metropolitan Council has responsibilities in both these areas and could solve the problem by recommending that a restriction be placed on the PCA permit that will allow only 30 trucks in a waiting line at any given time at the facility. The remainder of the trucks may travel to a landfill of their choice.

The Metropolitan Council has another avenue to solve this problem. I understand from county staff that the council has yet to approve their contracts. Here again the council could insist that NSP provide a certain turn around time for haulers and that waste which must be diverted because of NSP's inability to handle it would be credited to the county's minimum.

- 2 -

Thank you for your time, and if you have any questions,
please feel free to call me at 459-3890.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael C. Hinz". The signature is fluid and stylized, with the first name being the most prominent.

Michael C Hinz

Michael C. Hinz

Most of the issues in this letter were addressed in the response to Mr. Hines comments at the public meeting. A recommendation on the maximum number of trucks that will be allowed to wait at the facility is not appropriate at the EIS. The DEIS has been amended to identify capacity for waiting vehicles, throughput capability, and mitigation measures to improve operational efficiency. Permit restrictions and hauler contract approval considerations should be dealt with when the Metropolitan Council completes its review of these matters. The EIS information will be an important factor in the Council's evaluation of these matters.

ADDITIONS AND CHANGES TO DRAFT EIS TEXT

(Page 16, paragraph four, add the following after the first sentence):
Lower debt service expense should more than offset higher outlays for staff and electricity to operate and maintain a facility at the outset of an RDF processing project.

(Page 19, Paragraph three, replace the phrase in the first sentence that reads "several inherent disadvantages" with the following):
several disadvantages for Ramsey and Washington County

(Page 30, Insert after paragraph 2):
Another project size consideration involves the ability of different project size configurations to incorporate other waste management strategies. Co-composting in particular would complement any of the size configurations discussed and represents an additional size parameter that should be considered as an alternative.

Co-composting would complement the proposed RDF processing operation by combining the heavy residue fraction with sewage sludge. The operation could be situated to minimize transportation costs between the RDF facility and the Pigs Eye Sewage Treatment Plant. Transportation costs for landfill disposal would be drastically reduced.

With MSW intake at the RDF facility ranging from 1,000 to 1,350 tons per day, an additional 15 to 20 percent of the total waste stream would be diverted from landfills. Annual landfill abatement would range from 74,000 to 99,000 tons. This represents abatement that could not currently be accomplished through RDF processing technology alone. Refinements in RDF processing could be made to increase the BTU content of the RDF by increasing the volume of low BTU organic material separated for composting. Production of RDF ash requiring disposal would also be reduced.

The expansion of the RDF operation to add co-composting will require evaluation beyond the scope of this EIS. Topics that should be addressed include: site location, site size, methodology selection, identification of potential uses based upon product characteristics, regulatory constraints, market analysis, facility design based on markets, integration with the RDF operation, and marketing.

(Page 32, Table 4, add the following to the categories underlined):

Permit/Approval State certification of the federal dredge and fill permit, Agency MPCA, Authority Clean Water Act, Ch. 401, Review Time Period 30 days, Fees None, Comments Addresses all water quality implications.

Permit/Approval Approval process, Agency MPCA, Authority M.S. Sect. 116.07, Review Time Period 6 weeks, Fees None, Comments Approval is required to co-dispose ash with MSW. Testing will be required at the generator's expense.

(Page 38, paragraph 1; change the third sentence to read):
Water will be provided through a well and associated storage and pumping system. The well will be 8 inches in diameter, 250 to 300 feet deep, and capable of delivering 300 gallons per minute (average daily use will only be _____ gallons, however). The storage and pumping system are described in more detail in the chapter on Plant Safety and Management.

(Page 45, Paragraph 6, replace the last sentence with the following):
The cab will be airconditioned and be equipped for radio communication with the front end loader and hard wire communication with the control room.

(Page 66, paragraph 1, add to the list of mitigative measures):

- o use of filter fabric; and
- o construction of hay bale dams.

(Page 75, Insert after paragraph 1):

The alternative site to the north is currently being developed as a shredder landfill, with its final use designated for equipment storage. Loss of wildlife habitat will occur as the fill is developed; little additional loss would be expected if the site were used for the waste processing facility. Neither the alternative nor the proposed site is known to harbor any endangered or threatened species. Both sites are within Newport's Urban Diversified Area, an area that permits industrial development.

The proposed site may offer an opportunity to improve wildlife habitat in the long run. The project proposers could work with the U.S. Fish and Wildlife Service and the Minnesota Department of Natural Resources to design and create new on-site wetlands that would attract waterfowl, for instance. This opportunity is not available at the alternative site because the integrity of the fill could be jeopardized.

(Page 90, first line, delete the following):
ash retention

(Page 90, lines four and five, replace the phrase "specified in the permit" with the following):
estimated

(Page 91, Insert after paragraph 3):

The fly ash alone consistently produced extracts which tested as hazardous due to elevated levels of lead and cadmium. Column lysimeter tests also showed more metals and salts leached from waste-to-energy facility fly ash alone than from solid waste or bottom and fly ash combined. The leachate of salt and metals was higher per pound of solid waste than per pound of ash. Total dissolved solids leached from bottom ash and from combined ash was approximately 50 percent lower than from raw solid waste.

Comparison of leachates collected from sanitary landfills and ash only fills also showed that solid waste will produce higher salt and metal concentrations than equal weights of ash. The ash is more alkaline than solid waste which helps to stabilize the metal content. Heavy metals have extremely low solubilities in an alkaline environment. The report suggests that co-disposal with solid waste may lower leachate metal concentrations. Some empirical support was found in studies comparing leachate from fills that contained a mixture of solid waste and ash from open burning dumps with leachate from an equally aged sanitary landfill from the same locale.

The MPCA has conducted water and acid leach tests on bottom and fly ash from the three incinerators that are permitted to burn MSW in Minnesota. The fly ash consistently tested as hazardous due to high levels of lead and cadmium. The MPCA has not resolved a preferred means of addressing ash disposal. Although the alkalinity of the ash tends to stabilize the metals and reduce

leaching, the volume of metals in the ash may be deemed too high to allow the mixing of ash with MSW. Ash disposal may be restricted to segregated areas of sanitary landfills subject to permit standards that are nearly as strict as those for land disposing of MSW.

It is anticipated that the NSP boiler facilities will be labeled as hazardous waste generators. This status invokes a modest annual fee and inspection requirements. The facilities could be exempted from the Hazardous Waste Facility permit requirements if treatment of the metals occurs through an MPCA approved process that uniformly mixes the fly and bottom ash.

(Page 91, Insert after paragraph 2):

The Red Wing sanitary landfill has remaining capacity of 1.5 to two years in the demolition debris area and approximately 29,000 cubic yards of remaining capacity (five years at present fill rates) in the mixed municipal solid waste area. The RDF combustion facility is expected to produce 30,000 cubic yards of bottom ash per year. If ash is routed to the Pine Bend landfill, it will likely require deposit in a separate area of the landfill. In short, a suitable long-term disposal facility for combustion residuals has yet to be identified. A new or expanded land disposal facility will be required for Goodhue County or the ash will have to be deposited in a landfill located some distance from the combustion facility. If an ash-only landfill is proposed, it will likely be subject to design standards similar to those required for a mixed municipal landfill.

WN1209-PHENV3



Metropolitan Council
300 Metro Square Building
Seventh and Robert Streets
St. Paul, Minnesota 55101

Telephone (612) 291-6359

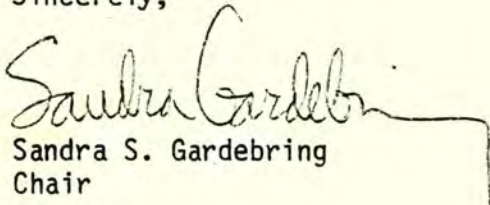
May 24, 1985

TO: Agencies, Organizations and Interested Persons

SUBJECT: Determination of Adequacy of the Ramsey/Washington Waste-to-Energy
Project for the Final Environmental Impact Statement (FEIS)

The Metropolitan Council reviewed the FEIS for the Ramsey/Washington Waste-to-Energy Project and found it adequate on May 23, 1985. The Council received the attached letter about the draft EIS after the public comment period closed and is forwarding it to interested parties along with the Council's response.

Sincerely,


Sandra S. Gardebring
Chair

SSG:sje

METROPOLITAN COUNCIL
Suite 300 Metro Square Building, St. Paul, Minnesota 55101
612-291-6359

DATE: May 13, 1985

TO: Environmental Resources Committee

FROM: Wayne Nelson, Parks and Environmental Planning Department

SUBJECT: Response to Late Submission for the Ramsey/Washington County
Waste-to-Energy Draft EIS

The attached letter from the Minnesota Department of Transportation (MnDOT) commenting on the DEIS was received by the Metropolitan Council on May 8, two working days after the end of the comment period on May 3, 1985. A response is presented below.

Traffic safety and operational problems would not be less significant at either the Aenco site just to the north or the Lake Elmo site. Traffic backed up from the railroad crossing adjacent to the Aenco site would frequently block a facility entrance there. The Lake Elmo site is more distant from the RDF user and potential landfill sites. The mitigation options of rail and barge transport are not accessible to the Lake Elmo site and truck noise would have a more significant impact there too.

Since the proposed site contains room for 40 trucks seeking access to deposit waste, the distance of approximately 100 feet between the Maxwell Rd./I-494 interchange should not create delays. The turning radii problem would only affect large 18-wheel semitrailer combinations that could be selected to haul recovered materials to various destinations. No explanation of how the short spacing might prevent turn lane construction is given. NSP has flexibility to situate the facility entrance on its substation property immediately adjacent to the north if more spacing is imperative.

The proposed development could interfere with the ease of construction of a parallel I-494 bridge on the north side of the existing one spanning the Mississippi. Desired right-of-way cannot be purchased because the proposed highway expansion has not been approved. While future I-494 expansion would likely be more expensive if the proposed site is developed, site development would not be precluded if the resource recovery project were constructed elsewhere.

The statement on page 20 of the DEIS that no other accessible and shielded vacant land is available in the vicinity for project development refers only to land within Ramsey or Washington Counties. The counties have at least an implied responsibility to provide for future waste management needs within their own boundaries if possible.

Project and Washington County staff will be advised of the MnDOT drainage permit requirement. The record of decision requirement is not optional. A Record of Decision for the utility permits was specified to assure that this work will be phased and designed so the affected roadways will accommodate the traffic flows projected in the DEIS. MnDOT preparation and submission of a record of decision to the Environmental Quality Board should not be an excessive burden.

The equivalent single axle load (ESAL) estimates presented in the DEIS may understate roadway impacts. MnDOT would like to recalculate these and verify the traffic count data used to evaluate anticipated "level of service" traffic flow conditions. The traffic count information will be forwarded to MnDOT. New ESAL estimates or "level of service" information should be used by MnDOT when it issues utility permits and improves nearby roadways. Any information received will also be forwarded to Washington County which has responsibility for the anticipated Maxwell Rd. improvements.

WN1210-PHENV3
05.13.85



Minnesota Department of Transportation
Transportation Building, St. Paul, MN 55155

May 1, 1985

Phone 296-1652

Wayne Nelson
Environmental Planner
Metropolitan Council
300 Metro Square Building
Seventh and Robert Street
St. Paul, Minnesota 55101

Re: Ramsey/Washington Waste-to-Energy Project
Draft Environmental Impact Statement (EIS)
District 9 (Newport - Washington/Ramsey Counties)

Dear Mr. Nelson:

The Minnesota Department of Transportation (Mn/DOT) has completed a review of the above referenced Draft EIS. We offer the following comments for your consideration in developing the Final EIS on the Ramsey/Washington Waste-to-Energy Project.

Mn/DOT anticipates that traffic safety and operations problems associated with this project, will be more significant if the site is located immediately adjacent to Interstate-(I)494 and less significant if the site is located further north at the Aenco site or at the Lake Elmo site. The site adjacent to I-494 will have an entrance to Maxwell Rd. located less than one hundred feet from the I-494/Maxwell Rd. interchange. This spacing does not allow sufficient room for turn lanes to be constructed on Maxwell Rd. at the ramps. The closeness of the entrance to the interchange and the inadequate turning radii noted in the Draft EIS will create delays and will result in trucks going out of their driving lanes in order to make necessary movements. Construction of a bypass lane on northbound Maxwell Rd. at the entrance to the project site would assist heavy truck traffic flow on Maxwell Rd. A bypass lane would not, however, address the problem of truck being forced to move out of their driving lanes.

The proposed site location adjacent to I-494 poses additional problems to Mn/DOT. We have identified a future need for additional capacity on I-494 across the Mississippi River. The eventual construction of a parallel bridge on the north side of the existing bridge is the most likely solution. At that time, redesign of the Maxwell Rd. and TH 61 interchanges would also be required. The proposed project location will constrain the future design of I-494 because of its proximity to the highway and use of right-of-way land that will be needed for Mn/DOT improvements.

Mr. Nelson
May 1, 1985
Page 2

These constraints and impacts have been discussed with Northern States Power Company the past few months. Because Mn/DOT's future improvements are not currently part of an approved highway project, costs associated with site adjustments to accommodate the proposed waste-to-energy project cannot be mitigated through advance purchase of right-of-way. Consequently, substantial use of costly retaining wall construction may be needed to facilitate Mn/DOT's future roadway improvements.

For these reasons, Mn/DOT would prefer the Aenco site for the proposed project. Both the Aenco site and the site located adjacent to I-494, however, will result in trucks entering I-494 on an upgrade ramp and therefore merging onto the freeway at low speeds. This potential safety hazard does not exist at the Lake Elmo site because the entrance ramps to I-694 are on a downgrade and are better designed.

Other Transportation related comments on the Draft EIS are as follows:

- . Page 20, paragraph 3. The statement that "It is readily apparent from Figure 2...that no other vacant land is available nearby that is both accessible... and shielded..." is not supported by Figure 2. It appears that land immediately west of the Mississippi River is available that could be accessed from I-494 using Hardman Ave. (Farwell Ave.).
- Page 32. A drainage permit must be obtained from Mn/DOT for the proposed project location adjacent to I-494 and should therefore be added to the permit list in Table 4.
- Page 34. Table 5 lists permits which will require a Record of Decision prepared on them. To my knowledge, Mn/DOT has not agreed to preparation of the Record of Decision for a Utility Permit and should not be listed.
- Page 38, paragraph 3. We found the esal estimates shown to be greatly understated because they were based on 24,000 lb. gross weight refuse trucks. A more realistic esals estimate would indicate anticipated resulting pavement damage on both I-494 and Maxwell Rd. and their ramps.
- Page 54. Mn/DOT is unable to reconcile the levels of service results shown in the Transportation section. We are therefore requesting copies of the traffic data sheets (machine counts and turning movement counts) used in these analyses.

Mr. Nelson
May 1, 1985
Page 3

Thank you for the opportunity to review and comment on the Draft EIS for the Ramsey/Washington Waste-to-Energy Project. If you have any questions regarding Mn/DOT's comments, please contact Jerry Skelton, Project Manager/Transportation Planning at our District Office in Oakdale, phone number (612) 779-1210.

Sincerely,



Cheryl Heide
Environmental Coordinator